FROM

RAILROAD GAZETTE

FRIDAY, AUGUST 13, 1897.

CONTENTS

Contributions.

Railroad Matters in China.

TIEN TSIN, June 18, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your article of April 30 [warning people in the United States against the extravagant stories about work and wages in China] will be a godsend to me. Owing to consular reports, etc., sent to the United States life has become hardly worth living. Catalogues and applications by the hundreds reach us, many of them covering the very last class of goods the Chinese will ever need, namely, wood-working machinery. With skilled carvers and carpenters at 15 gold cents a day such luxuries are wasted, especially as railroad work in China is done by fits and starts.

Some very dilapidated engineers have worked over to this side, believing that splendid berths awaited them. German, Belgian and Russian engineers swarm on every hand, and as they are supported by their governments or syndicates they can loaf about at ease.

The article by Mr. Van Bergen in your issue of May 14, 1897, is fairly correct, but perhaps a shade too strong as regards the rottenness of the Chinese. He is also not quite accurate regarding the lines built and building, and does not appear to have seen the lines himself. The road is now completed 40 miles beyond Shan Hai Kuan, and the section of 80 miles from Peking southwesterly to Pao-ting-fu is in hand.

The rails are laid to Peking and trains running, but they will have to stop when the floods come, as the line is not secure until many parts are well reveted with stone and the track ballasted. Floods may come now any hour, and as the supply of rolling stock is inadequate, stone cannot be got down in time. Over 150 carloads a day are received, but this is a bagatelle to what is needed. Stone has to be hauled on the average over 130 miles. C. E.

The Late Henry B. Stone.

CHICAGO, July 25, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have been a little surprised that you have not in your paper noticed at some length the sad termination of the short and brilliant career of Henry B. Stone, on July 5th. Mr. Stone's influence in railroad affairs was very great, and, as you doubtless know, he took a prominent part in the General Time Convention, later in the adoption of the Standard Code and in the advocacy of signals and safety appliances, for example air brakes. He was a man of much force and energy, of remarkable quickness of perception of essential details in compli cated matters, of singular and unquestioned courage and moral rectitude.

He was one of the early railroad men of the new school, and carried into railroad work at an important period of its development a mind singularly well trained to the intricate necessities of that period.

He was born in 1852, went as a boy to Phillips' Exeter Academy, graduated at Harvard University in 1873, took a year's course in mechanical engineering, mathematics and shop work at the Massachusetts Institute of Technology in Boston, then a year in a large machine shop at Waltham, and upward of a year in the gun foundry of the South Boston Iron Works. From the latter place he came early in 1877 to the Aurora locomotive shops of the Chicago, Burlington & Quincy, entering as a trained mechanic and in the position of a foreman (not general foreman). His rise in the motive power department you are familar with and also his resignation in 1890 of his position as Second Vice-President to take the Presidency of the telephone companies.

His connection with the strike of the engineers in 1888 is not generally understood. It is supposed by some that he brought it on by being too arbitrary, or on account of his unpopularity. Any such view is wrong. Mr. Stone was very popular with the enginemen and shopmen. He was their hero and champion, and had done much for them in the past. As students of the labor question must know, the storm had been brewing some time, the brotherhoods felt themselves irresistible. A few men holding influential places had little by little made greater and greater demands until the final one which brought on the fight with the C., B. & Q. Henry Stone bore the brunt of that fight most manfully, against heavy odds, and with scant sympathy from those from whom he had some right to expect it. He fought a good fight in the interests of his employers, towards whom he at all times felt a high sense of duty and he fought, too, for a principle, and settled for many years the question of whether the owners of a railroad or the employees shall dictate its policy.

I have said nothing of Mr. Stone's connection with the telephone interests, nor of his energetic work as a World's Fair Director, because other journals have dwelt upon that.

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[Our correspondent may well be surprised that we never published any notice of so distinguished a railroad man more adequate than the paragraph that we printed at the time of his most untimely death. That we did not, was only because of the absolute limits to time and energy that even an editor has to work within.—EDITOR RAILROAD GAZETTE.]

The Purdue Tests of Strong's Balanced Locomotive.

NEW YORK, Aug. 9, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your editorial in your issue of Aug. 16 was read with interest. Pardon me, if I point out some very good reasons for having opinions that are at variance with the conclusions therein expressed.

You say, "We question if they have any great practical value to locomotive builders or users, and they add little to the useful information already made common property by the publication of results of earlier tests." To agree with you we should have to conclude that the question of balancing locomotives had been satisfactorily solved, or if it had not it was not of any great importance, and not worthy of serious thought by practical men. That this is not the case I have only to refer to various and voluminous editorials on the subject of bent rails and the evils of badly balanced locomotives, that have appeared in the *Railroad Gazette* within the last few years, and to say that the evil has not been remedied, but only aggravated by the introduction of compound engines, where the amount of reciprocating weight on one side or both sides of the engines has been doubled, and the excess balance has had to be correspondingly increased. The question of a successful compound locomotive for high speeds is so intimately associated with the question of successful balancing that they cannot be separated, and a perfectly satisfactory compound produced. As an evidence of this, I would cite a single instance A very intelligent and progressive superintendent of motive power of a large system, who has had a large experience with nearly all compound locomotives now on the market, and who was originally a believer in compounds, is having a large number of engines built, none of which are compounds. When asked by a fellow superintendent why he was not having compounds built, he remarked, "Don't say anything about it here, but I have had enough," and when asked the reason, stated that "the very heavy pistons and weight of reciprocating parts made the use and ownership of such engines too expensive to warrant their use by reason of any coal that they would save, due to the compound feature."

Professor Goss states in his report on the test of the Schenectady locomotive No. 1 that the excess counterbalance on each side of the engine was 400 lbs., and that was enough to lift the wheel clear of the track at every revolution. Now, can you point out to me a single compound running to-day in the United States that, if a four-cylinder compound, has not very much more than 400 lbs. excess on each side of the engine? I can point out many that have double that, or 800 lbs. excess on each side, and all the two-cylinder compounds must necessarily have as much as 800 lbs. excess on one side to balance the low-pressure piston, piston-rod and one-half the connecting-rod. Now, there is not one of these that will not, if put on the testing plant at Purdue University and run at a speed of 300 revolutions, lift the wheels from the track or roller at every revolution, and that will not, if run at this speed on a track, exert double the normal pressure on the rail at every revolution.

Did you ever hear of a compound that was subjected to a test on a testing plant in the West, that it was not found safe to run at a speed of more than 20 miles per hour, and to do this it was necessary to back a large consolidation engine back against her to hold her on the rollers, so much was she out of balance in the horizontal direction? If you have never heard of that I can get you the particulars, and it would be interesting reading.

Now as to the big wheel and light reciprocating part remedy, as suggested by Mr. Barnes, I would say that most of the compounds I have mentioned above have been constructed on the principle that he advocated, and that the owners and designers carried that principle to the limit. But, owing to the very great increased diameter of cylinders and size of piston and piston rods, it has been found impossible to bring the weight of reciprocating parts down. And, as to the large driving wheel, it is of very limited application; not 10 per cent. of American locomotives would be suitable, or the work they have to do would be suitable for large drivers, as the majority of the damage is done by freight engines which must have small driving wheels, and by local passenger engines on which large drivers would not be suitable, owing to the slowness of starting. Most American roads are what are known as "cross-country roads" that have a succession of short hills or grades, on which an engine with large drivers with a heavy train cannot make time, as she slackens speed on the grades, and it is not safe and it should not be allowable to run at a very high speed down hills where the train would not at all times be under control.

As to conclusion No. 2: "That, it was not necessary to test this locomotive to know that it was a perfectly balanced engine," I would say that I agree with you. It was a self-evident fact to anyone thoroughly versed in engineering matters, but for most people, and especially those who have money invested in an enterprise of this magnitude, they do not look at it from that standpoint, and are convinced only by the most positive and disinterested testimony, and naturally, until that point has been reached, they have nothing to sell and would not care to conduct two experiments on the same subject at one time. This explains and answers your other query: "Why, if this were known to be a perfectly balanced locomotive, three years have been allowed to slip by without having a greater number of them in use?"

As to the objection which you urge, of the complication of the balanced compound locomotive No. 1, and your statement that "it makes an arrangement expensive and wholly impracticable for railroads in this country," I would say that this conclusion is wholly unwarranted by the facts before you, and that, if this be the only practical way of building a balanced compound and the engines were to cost double for the parts that go to make this one feature, *i. e.*, a balanced locomotive, the saving in repairs of the locomotive alone, to say nothing of the saving to tracks and bridges and all the rolling stock of every kind which suffers from bad tracks, as well as the question of safety to passengers and property, would warrant it. To show how serious this question is with railroads running very fast trains, the writer was riding on a fast train some time ago, with the superintendent of motive power of the road, when the gentleman remarked that this train does not pay, nor does any other run at this speed. I asked why, as the train was full, and of paying passengers, and always ran full. "Why," he said, "the repairs are tremendous, not only to this train and its locomotive, but to every other train that has to run over this track after it is full of kinks and we cannot keep the kinks out of the rails." Now, with a perfectly balanced locomotive the jar that was imparted to that train would all disappear, and the thumping and rolling and jumping of the locomotive that made the kinks would disappear and the engine and the train would roll as smoothly at the high speeds as at the lower speeds, and the question of economical high speed would be solved.

Now, as to questions of cost. The first cost of a locomotive has very little to do with its total cost, extending over its life of ten to twenty years. It is the three to five cents a mile and 10,000 miles per month, or 120,000 miles per year, or the 1,200,000 miles during its life, or $60,000 for repairs during a lifetime, with all the incidental repairs to track that follow, and all the incidental repairs that are due to cars and other locomotives that suffer from the track being knocked out of line. And I would say further, that we are in a position to furnish balanced compound locomotives that do not have any more working parts than the simple engine, non-compound, that can be constructed at as little first cost per horse power or per square foot of grate area and heating surface, and that meet every requirement of a perfectly balanced compound.

GEO. S. STRONG.

The Soudan Railroad.

The expeditionary force which the British and Egyptian governments sent into the Soudan last year did a good deal of work in repairing and extending the old Soudan Railroad. This expedition, though completely successful in itself, was but a step toward a much larger object—the recovery of all the revolted provinces of the Soudan. In future campaigns the further extension of railroad communication will, no doubt, play a very important part. Even here in London it is by no means easy to find out at all precisely either what has been done already or what is being projected in the future. The work is in the hands of the Royal Engineers and its details are being directed, apparently, entirely from Egypt. The War Office here does not know, or is not at liberty to give, detailed information. However, it is possible to construct a narrative of the railroad operations which will, at least, assist your readers to follow future developments intelligently. But a more precise and technical account of the matter will need to be written if its valuable lessons are to be preserved for railroad and military engineers.

Originally suggested by Said Pasha as long ago as 1857, a railroad into the Soudan was first seriously projected in the early seventies by the Khedive

Ismail, who in 1873 employed the eminent English engineer, Mr. (now Sir) John Fowler to make surveys and prepare a scheme. The main Egyptian railroad system then extended from Cairo southward along the bank of the Nile about 180 miles to Roda; Mr. Fowler proposed to commence operations nearly 600 miles further up the Nile, at Wady Halfa, leaving this great intervening space to be got over (pending the gradual extension of the Egyptian Railroad) by river transport. A great difficulty in this plan was the existence of the first cataract at Assouan (about 299 miles from Wady Half). To get over this, Mr. Fowler proposed the construction of a "ship incline" there. This, he calculated, would remove the only serious obstacle to the river transport between the terminus of the Egyptian railroad system and the second cataract at Wady Halfa, but thence southwards the Nile greatly deteriorates for a long distance as a channel for navigation. Accordingly, from Wady Halfa, by the right bank of the river to Kohe, thence by the left bank of the river to Ambukol, and thence across the Bahuida Desert to Shendy, he proposed to construct a railroad 889 kilometers in length in all, which might land passengers on the Nile again, at a point where it is navigable, within 100 miles of Khartoum.

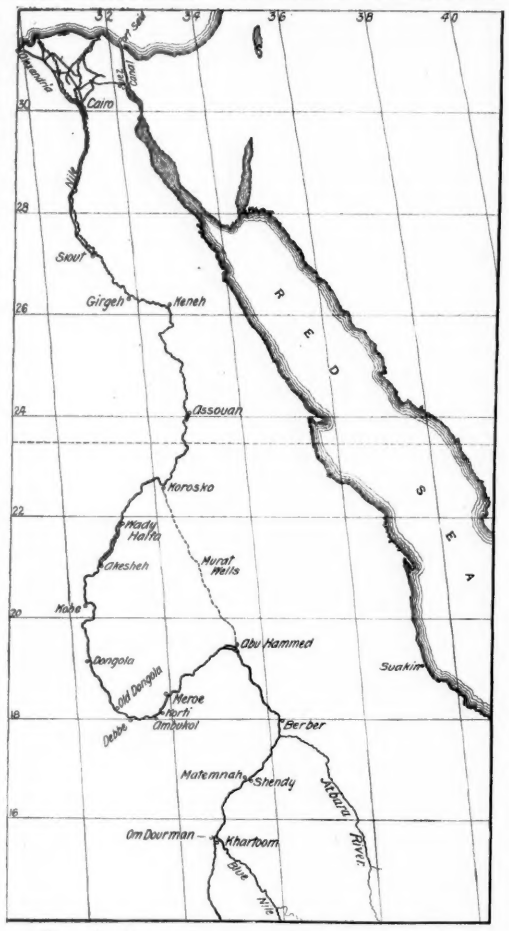
This ambitious scheme was taken energetically in hand by Ismail in 1874. The first thing done was to construct an ordinanary railroad, 4 ft. 8½ in. gage, 9 miles in length, from the Nile at Assouan to the Nile again at Philæ (or Shellal), so that the materials for the line into the Soudan might be got over the first cataract pending the construction of the ship incline. Then operations were commenced at Wady Halfa, with the result that a 3 ft. 6 in. gage line, formed of iron rails 50 lbs. to the yard and iron sleepers, was laid for 34½ miles from Wady Halfa to Sarras. The works on this section were light, the line keeping within a comparatively short distance of the river and winding among rocky hills with rather sharp curves. Beyond Sarras, however, it was found that to keep the line near the river would involve at least six tunnels of considerable length through solid granite rock, with other large and costly works. So an alternative route across the desert *via* Murrat (or Maghrat) Wells—not to be confounded with the similarly named Murat Wells—had to be adopted, and, in the language of Mr. Fowler's report, the line had to "pursue a tortuous and undulating course between rugged mountains rising precipitously on all sides and across wild gorges down which tropical flood waters occasionally rush with violence." On this section the formation had been completed for about 22 miles when it was stopped by Ismail's financial difficulties, not again to be resumed under his régime.

For 10 years nothing further was done, until General Gordon had become shut up in Khartoum, and the British government, in 1884, decided to send an expedition by the Nile route to relieve him. The Egyptian railroad system had by this time been extended from Roda, about 50 miles further up the Nile, to Assiut (or Siut), and, having covered the 320 miles between that place and Assouan by river, the expeditionary force made what use they could of the little Assouan to Philæ Railroad, to get their baggage and guns over the first cataract. They found both its permanent way and equipment, however, in a very poor state, owing to lack of repairing material and to the injurious action of the desert sand, which had been found to wear out bearings with great rapidity. Arrived at Wady Halfa, they found the line between there and Sarras, too, in very bad order and some of the bridges unsafe. But, having had it repaired, Lord Wolseley found it of much service, and so proposed to extend it, for the purposes of the expedition, from its existing terminus past Akasheh to Ferkeh, a distance in all of about 100 miles from Wady Halfa. Beyond Sarras, as already stated, the course of the Nile could no longer be followed, owing to its rocky and difficult character: and even the route which Mr. Fowler had staked out (which allowed for the river being rejoined at short intervals) involved works, notably a cutting a kilometer in length and 5 meters in maximum depth, which were beyond the scope of an expeditionary force. Accordingly, the engineers, with Lord Wolseley, decided to strike right across the desert from Sarras to Akasheh, a distance of more than 40 miles, though water is procurable at two points only on this route and there but in small quantity and poor quality.

This work was in hand when Khartoum fell (January, 1885), and very shortly afterward the British government changed the object of the expedition from the relief of Gordon to a complete crushing of the powers of the Mahdi. Completely altering its plan of operations the War Office decided to make the Red Sea, instead of the Nile, the future base, and in February, 1885, a contract was hurriedly entered into with the well-known English contractors Messrs. Lucas & Aird to make a railroad as quickly as possible from Suakin to Berber, 245 miles across desert, and in March, 1885, a vast quantity of material for the new undertaking was disembarked at Suakin. It included 10,000 tons of 56-lb. steel rails, one-quarter million sleepers, six four-wheel and 10 six-wheel locomotives, a double tank water car of a capacity of 4,000 gals. and 161,000 ft.—more than 30 miles—of wrought-iron pipe for conveying water, this tubing being similar to that used in petroleum districts, and being obtained from Henry R. Worthington, of New York. It was proposed to open up the country ahead of the permanent works with a line of 1 ft. 6 in. gage, and for this 600 tons of steel sleepers were shipped, 2,470 tons of rails and 12 locomotives; 125 British "navvies" were also sent, and a large number of coolies from India. At the same time, in response to Lord Wolseley's urgent representations, the work on the line from Wady Halfa was continued.

In April, 1885, Mr. Gladstone's government announced the practical evacuation of the Soudan; work on the line from Suakin was abandoned, and in May, 1885, transports commenced bringing home the material. On the other hand, the work on the old railroad was persevered with, and on Aug. 7, 1885, Lord Wolseley had the satisfaction of seeing the first train steam into Akasheh. About six miles of the formation, also, was completed toward Ferkeh, and a new government having by this time come into power, Lord Wolseley made an effort to get authority to complete his scheme of finishing the line to that place. The policy of evacuation, however, had been carried too far, and nothing further was done. As for the materials for the Suakin-Berber line, they lay at Woolwich Arsenal, London, almost intact for some years, but have since been dispersed for various works. Practically none are now available.

Another decade elapsed without anything further being done, and we arrive at the campaign so suddenly determined upon in March of last year. The Egyptian railroad system had by this time been extended from Assiut to Beliena, about ten times south of Girgeh. From Korosco, which is rather more than halfway from Assuan to Wady Halfa, the Sirdar (or Commander-in-Chief) of the Egyptian Army, Sir Herbert Kitchener, had made a start some months before in constructing a railroad of normal gage to follow the caravan route across the desert *via* Murat Wells, to meet the Nile again at Abu Hamed. The distance is about 230 miles



The Nile Below Khartoum—Showing the Soudan Railroad.

Scale, 1 in. = 233 miles.

as the crow flies, and, as it avoids the great loop which the Nile makes in the province of Dongola, it is quite 400 miles shorter than the course of the river. But, obviously, it was not a route suitable to an expedition the main object of which was to reconquer Dongola, and it would have been impossible to push it forward in time to have been of any substantial service. Accordingly what rails, sleepers, &c., had been laid down were torn up, and the whole material carried to Wady Halfa for use in repairing and extending the old line from there.

Immediately after the retirement of Lord Wolseley's force in 1885 the frontier line had been withdrawn to Wady Halfa and the old railroad practically abandoned, but in 1889 Sarras had been re-occupied as an advance post, and from that date the 34½ miles of line between Halfa and Sarras had been kept in working order. On the other hand from Sarras southward about 50 miles to the termination of the formation, six miles beyond Akasheh, the line had been practically at the mercy of the dervishes for 10 years. The new expedition found that the amount of damage done was less than might have been anticipated; indeed, where the line crosses the desert at a distance from the site of the Dervish camps, considerable sections of it—notably, nine miles south of Ambigol Wells—were found quite undisturbed. Even where the permanent-way had been removed, the rails were generally found near at hand—quite free from rust. On the other hand, the smaller iron—spikes fish-plates, bolts, etc.—had been taken away almost entirely, and the sleepers had very generally been burnt as firewood. In a few places, too, the dervishes had broken the line into sections and then turned it over bodily. But, still, the expedition found that rails nearly sufficient in number were already at hand.

The expedition did not start until near the end of March, 1896, but by the middle of April the work of railroad repair had been taken actively in hand south of Sarras, and by the 20th the telegraph was laid to Akasheh. Strong galvanized wire for this was supplied from the Egyptian telegraph department, and for a good part of the way it was not necessary to do more than lay the wire along the dry sand. The railroad work was carried on by a battalion of Egyptian conscripts under the superintendence of officers of the Royal Engineers. Seven hundred and fifty yards of track was at first a "record" for a day's work. It was working in the face of the enemy, for the dervishes were expected at any time to try to rush the rail-head, when the plate-layers would have to drop pick and crowbar and take up their Remingtons, which were always piled near. A strong picket of the 7th Egyptian Battalion, however, constantly kept guard ahead of the works.

By the end of May the railroad camp had passed Murrat Wells and was pitched at Ambigol Wells, the second of the two watering miles in the 40 miles of rocky desert between Harras and Akasheh. But even at Murrat and Ambigol the supply of water is insignificant, and so a train of trucks containing water tanks had to be run back each morning to Sarras, where the tanks were filled from the Nile. The line through this "Belly of Rocks" presents an almost continual succession of little curves; for, to avoid cuttings, every spur of the volcanic rocks was turned. Early in June the headquarters of the force were transferred from Halfa to Akasheh, the troops traveling by train as far as Ambigol Wells. Almost immediately, followed the night-march on Ferkeh, 16 miles from Akasheh, and the first victory over the dervishes (June 7). Then the camp was established near Ferkeh, which is also, like Akasheh, on the Nile bank, and from there railroad work was commenced in both directions—northward about 12 miles to meet the end of the old formation, and southward about five miles along the river to Kosheh. At Kosheh it was proposed to construct a steamer-dock to which gunboats might be brought up by rail in sections. From Kosheh to Dongola navigation is not difficult. Meantime, work had been steadily pressed on from the rail-head at Ambigol Wells, and Akasheh was reached by rail on June 21.

Meantime at Ferkeh the task of preparing the road-bed in both directions had been taken vigorously in hand. There was no danger now from the enemy, and it was a great advantage to be able to take in hand several sections of the line at a time.

All, however, was not destined to go smoothly. Toward the end of June the cholera came traveling up the river from point to point, and the first Englishman to fall a victim to it was Mr. Vallom, Chief Superintendent of Engines and Workshops at Wady Halfa, which post he had occupied for 11 years. It was largely owing to his skill and energy that the railroad had been kept working for three months, despite the blunders of untrained engine drivers and other native subordinates. All through July the cholera raged, costing many lives, and at the end of the month came another curse—a week of most exceptional rainstorms. At Kosheh the water poured toward the Nile by every gully, to be dammed up by the railroad embankment till it formed a long lake nearly half a mile in breadth and quite 10 ft. deep in places. However, the danger of a great washout was averted, and on Aug. 4 the rails reached Kosheh. Of course, the first piece of transport taken in hand was the bringing up of the gunboats, and on the evening of Aug. 14 the hearts of those in camp at Kosheh, long depressed by disease and accident, were cheered by a strange sight. "Just before sunset," writes the correspondent of the London *Times*, "we heard the whistle of the locomotive and perceived, rolling slowly across the desert toward the camp, a train with four trucks bearing what appeared to be four huge square iron cases, painted red, each as big as a two-story house and towering high above the engine. We knew them to be the first four sections of the new gunboat."

All trouble, however, was not yet over. On Aug. 25 came a second terrific rainstorm, worse than the first—such a storm as had not been known in the desert within living memory, and two days later a camelman brought news to the camp at Kosheh that 12 miles of the railroad south of Sarras had been washed away. This was part of the old formation made in 1874, and for 22 years it had stood unaffected by such light normal rains as had fallen. Now it had been covered deep in water, the ballast swept away; rails and sleepers washed as much as 70 yards from the track, and some of the banks so destroyed as to leave wide gaps in the formation. The whole railway camp, too, at Serras had been swept away.

The Sirdar at once set out for the scene of the disaster, and 5,000 men were speedily concentrated to repair the line as the water fell. They were hard at work when a fresh storm destroyed eight miles more of the railway, including the station at Akasheh. However, by September 6, the repairs were completed and the line of communication once more open throughout from Wady Halfa to Kosheh, where a large piece of land adjacent to the river had been laid out with sidings. On March

17, the advance on Dongola by desert and river commenced, and on Sept. 24 the town was captured, and the object of the expedition achieved.

Prior to the return of the main body of the expedition the railroad formation was pushed forward some distance beyond Kosheh, and it is said that it has since been completed to Abu Fatmeh, a point on the Nile at the beginning of a long stretch of easily navigable river which extends past Dongola to Merowe. The current report here, however, is that this will not be the route of the next advance. Korosko, it is said, is to be made the base of this year's expedition, and the objective of course is Abu Hamed, the distance to which place from Korosco across the desert is, as already stated, at least 400 miles shorter than if the long loop of the Nile be followed *via* Dongola; and if gunboats can be launched at Abu Hamed, they will have little difficulty in reaching and capturing Berber. But the route from Korosco to Abu Hamed is over a terrible desert, relieved only by a single watering-place about midway—Murat Wells.*

A high authority of the War Office has expressed to me a strong opinion that the route from Korosco to Abu Hamed is inferior for railroad purposes to that from Suakin to Berber (245 miles). Probably, after all, the first advance will be made by the line already constructed; for, even if the desert line be carried to Murat Wells, it would seem to be impossible to push it further while the country beyond, including Abu Hamed, remains in the hands of the enemy. Similarly, the construction of a Suakin-Berber line is impracticable until Berber is captured.

C. H. GRINLING.

LONDON, April 21, 1897.

Many years ago the present editor of the *Railroad Gazette*, then an officer of the Egyptian Army, made a careful reconnaissance of the route between Suakin and Berber with a view to marching troops across that desert. When he reached Berber and made up his report he felt bound to add a short special report on this route as the proper line for a railroad into the Soudan. He said "a line of 400 kilometers, which places the produce of the Soudan at once in a seaport, which realizes Mr. Fowler's idea of the advantages to result from connecting the Soudan Railway with the Red Sea and which brings Berber within six days of Cairo—such a line needs no advocate. . . . From my hasty examination of the line, it seems so obvious a position and so easy a route that the more I think of it, the more diffidence I feel in presenting my opinion of it, thinking that some great and apparent objection must have escaped my notice." From barometric altitudes it was believed that the mountains could be crossed with a maximum grade of 2 per cent. and it was probable that considerably better grades could be found by a little exploration to the south. Otherwise there is no physical difficulty in this route; most of it, in fact, lies across hard gravel plains, where little work would need to be done. By this route the heart of the Soudan is within 240 miles of deep water, by rail. By the Nile route the distance from Berber to Alexandria is about 1,300 miles and Mr. Fowler's plan involved several trans-shipments of freight. It is obvious that few commodities could stand the cost of transportation under such circumstances and that the commerce of the Soudan could not be seriously developed by the Nile route project. So far as the writer knows, the suggestion of the Suakin-Berber Railroad was original with him, but whether or not he was the first to propose it makes little difference. If his suggestion had been acted upon the Soudan would never have been lost to Egypt, all the terrible bloodshed and expenditure of money which have been involved in the effort to reconquer the Soudan would have been saved, and in all probability General Gordon would still be alive. There was, however, a reason for not building that railroad which probably outweighed at Cairo all other reasons united. The Khedive was not allowed by Turkey to keep a navy, and therefore he would not think of allowing the key to the Soudan to be in a port down the Red Sea. For purely strategic reasons he chose to develop the Nile route.

Chicago Track Elevation.

In the *Railroad Gazette*, July 26, 1895, was given a description of the work of elevating the tracks on the Galena Division of the Chicago & Northwestern Railway, beginning at a point 2,045 ft. west of West Fortieth street and extending 1,080 ft. east of Sacramento avenue. We now give a plan and profile of the work to be done this year by the Chicago & Northwestern Railway and the Pittsburgh, Cincinnati, Chicago & St. Louis Railway jointly in elevating the tracks running south in Rockwell street from the Galena Division.

Fig. 1 shows the arrangement of the tracks at either end of the portion to be elevated. There are in Rockwell street two main tracks of the Pittsburgh, Cincinnati, Chicago & St. Louis and three freight tracks of the Chicago & Northwestern, beside numerous spur tracks to manufactories along the lines. These tracks form the connection of the Chicago & Northwestern with the Union Stock Yards and various freight-houses, elevators and yards situated between Fourteenth and Sixteenth streets. The crossing of the Chicago & Northern Pacific between Fillmore street and West Twelfth street makes the work at the south end more complicated.

On Jan. 18 the Chicago City Council passed an ordinance, which has been accepted by the three railroad companies concerned, for the elevation of the tracks, starting at the west line of California avenue on the Chicago & Northwestern, and at a corresponding point on the Pittsburgh, Cincinnati, Chicago & St. Louis; the new grade rises on a .38 per cent. slope, for a distance of 2,000 ft. to a point about 250 ft. north of the north line of Lake street; thence level for 900 ft. to a point 50 ft. south of the south line of Washington Boulevard; from this point there is a .14 per cent. descending grade for 3,650 ft. becoming level at a point 100 ft. south of the south line of Flournoy street; the level stretch extends to the south side of Taylor street, a distance of 1,200 ft.; thence on a descending grade of .407 per cent. for 980 ft. to the south side of Twelfth street, from which point the grade is .70 per cent for 1,100 ft., meeting the old grade at the north line of Ogden avenue, at which point there is now a viaduct over the tracks. The total length of the portion to be elevated is 9,830 ft. Fig. 2 is a profile showing both the present and proposed grades and the location of the streets where subways will be built.

In the table s given a list of the subways, the number of tracks to be provided for at each point, the width of the subways between walls, the overhead clearance, the amount of depression of the subways and the elevation of the tracks. There will be in all 19 subways carrying in most cases five or six tracks, although at Twelfth Street 10 tracks will be provided for. At this point, also, the width of the subway will be 100 ft., the average width being about 66 ft. The depressions of the subways in most cases are from three to four feet, while the elevation of the tracks is generally from nine to ten feet. The tracks to be elevated are crossed at four different points by surface electric lines and also by one cable line, all of which will be placed in the subways. The Lake Street Elevated Railroad and the Metropolitan West Side Elevated Railroad are required by the ordinance to raise their tracks to a height of not less than 20

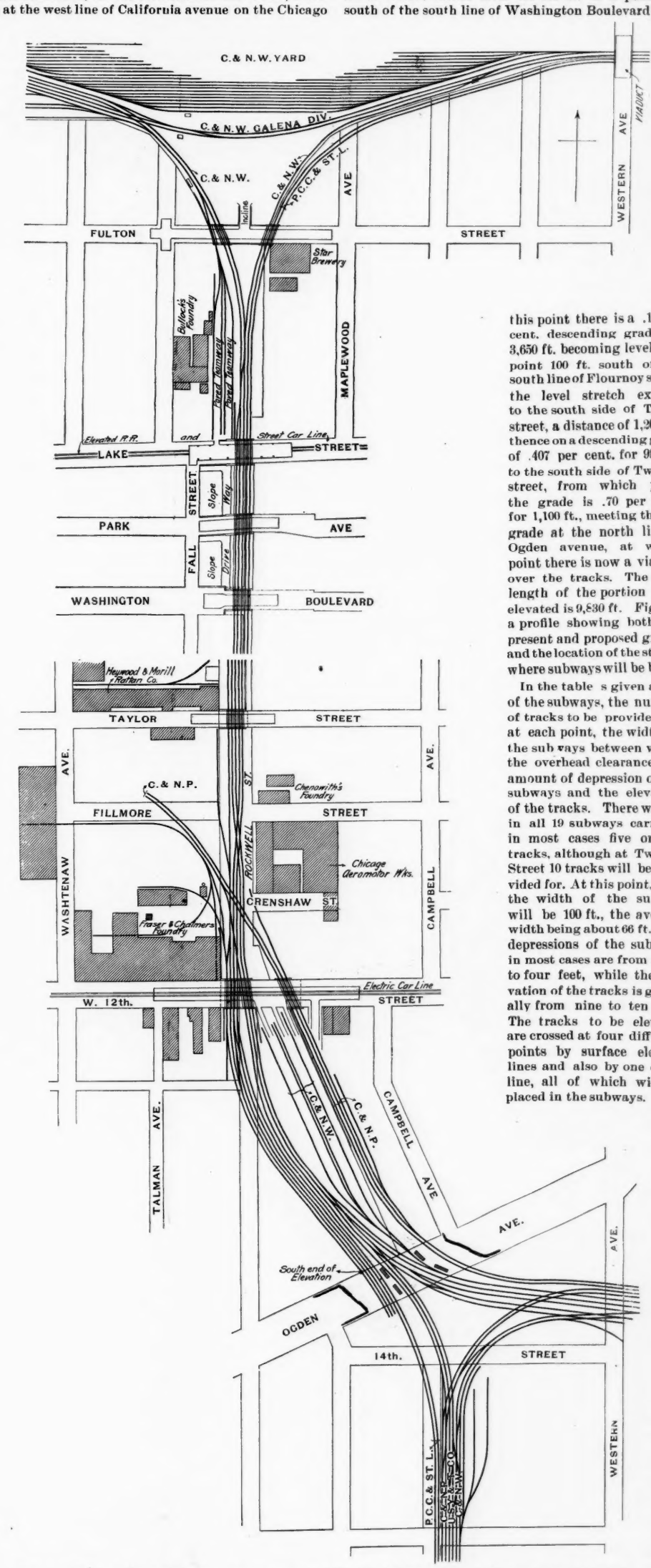


Fig. 1—Chicago Track Elevation—Arrangement of Tracks at Either End of Portion to be Elevated.

*Abu Hamed (or as we prefer Aboo Hammed) was taken a few days ago. The advance was by the Nile and not by the Korosko desert, as any well-informed man knew it must be. An army could not be marched across the Korosko desert except at terrible cost in time, money and life.

ft. above the level of the tops of the rails of the steam roads when brought up to the new grade.

Fig. 3 is a plan of the subway for Washington Boulevard, which is similar to those used at most points, while Fig. 4 shows the subway at West Twelfth street, which differs from the others in the greater number of

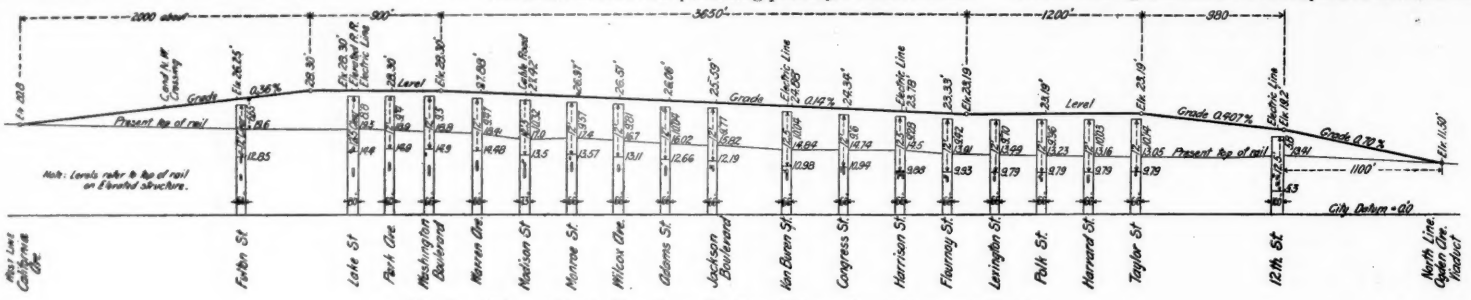


Fig. 2.—Chicago Track Elevation—Profile of Present and Proposed Grades.

tracks to be carried and, on account of the greater width between walls, posts are used to support the girders, being placed at the edge of the sidewalk. The girders are continuous between abutments.

The only elevation which will be done by the Chicago & Northern Pacific Railroad at this time is that necessary to bring its present tracks up to the new grade at Twelfth street and at the crossing of the Chicago & Northwestern and Pittsburgh, Cincinnati, Chicago & St. Louis. From these points its tracks will descend on about a .7 per cent. grade to meet the existing roadbed.

The work will be done jointly by the Pittsburgh, Cincinnati, Chicago & St. Louis and Chicago & Northwestern and will be in charge of Mr. Louis H. Evans, Engineer of Track Elevation of the latter road. The

TABLE.

Name of street.	No. of tracks.	Width of subway between walls. Ft.	Clearance. Ft.	Depression of subway. Ft.	Elevation of tracks. Ft.
Fulton street	6	66	12	6.75	6.65
‡Lake street	5	80	12.5	5.1	8.8
Park avenue	5	60	12	4.0	9.4
Washington Boulevard	5	66	12	3.9	9.5
Warren avenue	5	66	12	3.93	9 47
†Madison street	6	73	12.5	3.6	10.32
Monroe street	5	66	12	3.83	9 57
Wilcox avenue	5	66	12	3 59	9.81
Adams street	6	66	12	3.36	10 04
Jackson Boulevard	6	66	12	3 63	9.77
*Van Buren street	5	66	12.5	3.86	10.04
**Congress street	5	66	12	3.80	9.6
*Harrison street	5	66	12.5	4.62	9.28
Flournoy street	5	66	12	3.98	9.42
Lexington street	5	66	12	3.70	9.70
Polk street	6	66	12	3.44	9.96
Harvard street	6	66	12	3 37	10.03
Taylor street	5	66	12	3.26	10.14
*Twelfth street	10	100	12.5	8.1	5.8

*Electric surface road crosses here.

†Cable surface road crosses here.

‡Lake Street Elevated road crosses here.

**Metropolitan West Side Elevated Railroad crosses between Van Buren and Congress streets.

same methods will be used as were employed in elevating the Galena and Milwaukee divisions, described in the *Railroad Gazette*, July 26, 1895, and Aug. 7 and 14, 1896. The materials for filling and for use in building the subways will be the same as was used heretofore on this class of work.

The ordinance requires that the entire work shall be completed by Dec. 31, 1898, but contains also the usual

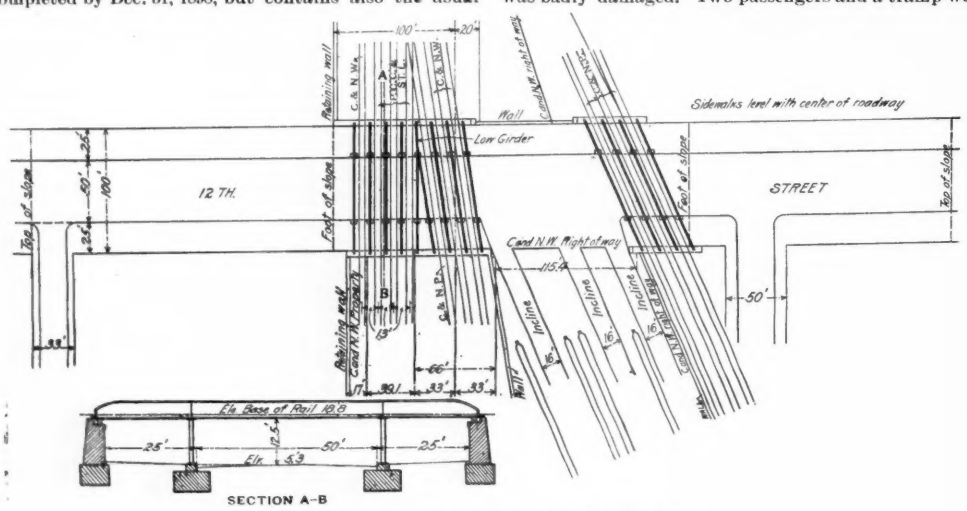


Fig. 4.—Street Plan of Subway—West Twelfth Street.

clause providing for delays due to strikes or interruptions beyond the control of the railroad companies. The work was begun March 29 at Lake street, and we are informed that it will go forward as rapidly as possible.

For the drawings and information regarding this work we are indebted to Mr. Louis H. Evans.

Train Accidents in the United States in June.

COLLISIONS.

REAR.

3d, on Manhattan Elevated, Second avenue line, at Eighty-sixth street, New York City, a passenger train ran into the rear of a preceding passenger train, damaging the engine and one car. The second train was approaching the station at uncontrollable speed.

18th, on Oregon Short Line, near Oasis, Utah, a mixed train descending a grade broke in two, and the rear portion afterward ran into the forward one, doing considerable damage. A passenger in the sleeping car was injured.

18th, night, on Chicago, Burlington & Quincy, near Creston, Ia., a passenger train ran into two freight cars which had been blown out of a siding upon the main track, wrecking the freight car. The engineman was killed and the fireman injured.

23d, on West Jersey & Seashore, near Woodbury, N. J., a freight train ran into the rear of a preceding passenger train, which had been stopped on account of a broken eccentric strap on the locomotive. The rear car of the passenger train, a combined passenger and baggage car, was badly damaged and set on fire by the locomotive; the fire was extinguished by the Woodbury Fire Company. No passengers were in the rear car. Seven passengers in other cars were slightly injured. The train stopped at the outgoing end of a block section, and it appears that the freight train was wrongfully admitted to the section by the signalman at the entering end, without authority from the man at the outgoing end.

26th, on Baltimore & Ohio, near Draketown, Pa., a freight train ran into the rear of a preceding freight which had just started from a tank.

A third freight soon afterward ran into the rear of the second one. One engineman was injured.

29th, on Philadelphia, Wilmington & Baltimore, near Perryman, Md., a freight train broke in two and the rear portion afterward ran into the forward one, and eight cars were damaged. The conductor and one brakeman were injured.

30th, 1 a. m., on Chicago & Northwestern, at West Chicago, Ill., the fourth section of a passenger train which had been stopped to take water was run into at the rear by the fifth section, and the car next to the last was badly damaged. Two passengers and a tramp were killed and 20 passengers and one employee were injured. The engineman of the fifth section did not properly control the speed of his train.

And 11 others on 8 roads, involving 2 passenger and 14 freight and other trains.

BUTTING.

1st, on Mobile & Ohio, near Trenton, Tenn., butting collision of freight trains, wrecking both engines and 12 cars. A man in charge of fruit riding in one of the cars was killed. It is said that the southbound train acted contrary to an order which it had received. One of the trains had been flagged and nearly stopped by a farmer living near the track who saw the impending danger.

7th, on Chicago, St. Paul, Minneapolis & Omaha, near Hudson, Wis., butting collision between a freight train which was running west (on the eastbound track) and a work train, with the workmen's car foremost, which was running east, making a very bad wreck. Four employees in the car were killed and their bodies, with the car, were burned up. The fireman of the work train and one other employee were killed and two employees were injured. The conductor and engineman of the work train had a special order to use the westbound track, going to and from dinner, but on their return took the eastbound track. They cannot explain their blunder.

10th, 5 a. m., on Illinois Central, at Bradford, Tenn., butting collision of freight trains, making a bad wreck. Five trainmen were injured, 2 of them fatally.

12th, on New York, New Haven & Hartford, near Middletown, Conn., butting collision between a regular and a special passenger train, slightly damaging both engines. Eight passengers and 2 trainmen were injured.

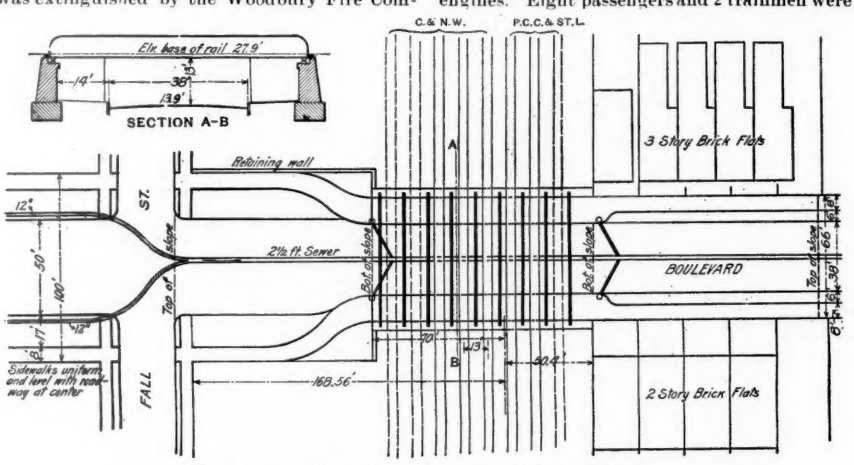


Fig. 3.—Street Plan of Subway—Washington Boulevard.

The regular train disregarded a telegraphic meeting order.

17th, on Union Pacific, at Tie Siding, Wyo., collision between a freight train and an empty engine; 1 engineman injured. It is said that the train dispatcher had made a change in meeting points and had notified only one of the enginemen.

21st, on International & Great Northern, near Conroe, Tex., butting collision between a southbound passenger train and a northbound freight train, wrecking both engines, six freight cars and the first two cars of the passenger train. Three white tramps riding on the freight train and three colored tramps riding on the trucks of the passenger train were killed. Two enginemen and two firemen were injured by jumping off and two other trainmen were injured.

22d, near Madden, Tex., butting collision between an eastbound Texas & Pacific passenger train and a westbound Southern Pacific freight, wrecking both engines, 11 freight cars and 2 baggage cars. It appears that the engineman of the passenger train mistook an extra freight, standing on a side track, bearing white signals, for the second section of a regular freight, and it was this second section that he collided with a mile east of the siding. The engineman of the freight train was killed and the mail clerk was injured.

26th, 7 a. m., on Cleveland, Akron & Columbus, near Millersburg, O., butting collision between a freight train and an excursion train, wrecking both engines and a baggage car. In the baggage car there were about 20 passengers, 10 of whom were injured, one of them fatally. It appears that the passenger train was running as the second section of a regular train that had passed about 10 hours before. The freight conductor examined the register at Millersburg; he found against the record of the regular train "green signals," the entry having been originally made "no signals" and these words crossed out. So long a time having elapsed since the passage of the first section, the conductor assumed that some unauthorized person had tampered with the record and went on as though he had a clear right to the road. He had gone but a very short distance before he met the passenger train, traveling at the rate of 30 miles an hour.

27th, on Prospect Park & Coney Island road, at Van Siclen Station, Brooklyn, N. Y., a passenger train ran over a misplaced switch and into the head of another passenger train, doing slight damage. A passenger who jumped out of one of the cars through a window was badly injured.

29th, 8 p. m., on Vandalia Line, near Vandalia, Ill., butting collision between westbound passenger train No. 11 eastbound passenger train No. 6. A baggageman and one mail clerk were killed and a fireman and one mail clerk were injured.

And 3 others on 3 roads, involving 6 freight trains.

CROSSING AND MISCELLANEOUS.

10th, on Lehigh Valley, near Geneva, N. Y., a pushing engine backed into the rear end of a standing freight train, wrecking the caboose and killing the fireman.

The engineman of the pusher and the conductor of the freight, who was in the caboose, were injured.

25th, on Missouri, Kansas & Texas, near Montrose, Mo., a passenger train ran into some freight cars which had been blown out from a siding to the main track. A man inside of one of the freight cars was killed.

26th, on Southern Railway, at Hurt's, Va., collision between a northbound and a southbound freight at a meeting point, one of the trains being partly on the side-track. Ten cars were damaged. Four tramps were injured.

And 5 others on 5 roads, involving 3 passenger and 6 freight trains.

DERAILMENTS.

DEFECTS OF ROAD.

12th, on St. Louis Southwestern, at Stuttgart, Ark., a freight train was derailed by running upon a small bridge which had been weakened by fire, and 6 cars were wrecked and burned up. Two tramps were injured and one of them was burned to death.

14th, on Grand Rapids & Indiana, near Winchester, Ind., passenger train No. 2 ran off the track at a point where the rails had been distorted by the intense heat of the sun, and the engine and first two cars were overturned. The engineman was killed and 3 trainmen were injured.

16th, 1 a. m., on Union Pacific, at Bridger Station, Wyo., passenger train No. 4 was derailed by a broken rail and 2 sleeping cars were damaged. A porter was injured.

26th, on Wabash road, near Missouri City, Mo., a passenger train broke through a trestle bridge which had been weakened by a flood and the tender and first three or four cars fell into the water. The baggageman, one brakeman and 6 postal clerks were killed, most of them being drowned, and the conductor and 10 passengers were injured. The wreck of a highway bridge floating down stream on the flood pushed the railroad bridge out of place. A farmer discovered the trouble and attempted to stop the train but failed to draw the attention of the engineman.

And 2 others on 2 roads, involving 2 freight trains.

DEFECTS OF EQUIPMENT.

1st, on Baltimore & Ohio, near Martinsburg, W. Va., an engine and several cars coming out of a stone quarry on a steep descending grade became uncontrollable in consequence of the failure of a brake chain and were derailed at a curve, the engine being overturned. Two trainmen were pinned down by the engine and badly scalded.

5th, 4 a. m., on Denver, Leadville & Gunnison, at Argentine, Col , the tender, 8 freight cars and one passenger car of a mixed train were derailed and ditched by the breaking of a truck. The conductor and one passenger were injured.

13th, on Atchison, Topeka & Santa Fe, near Oliver, Mo., a freight train was derailed by a broken flange and 12 cars were wrecked. One brakeman and 3 tramps were killed.

14th, on Cincinnati, Hamilton & Dayton, near La Grange, O., a mixed train was derailed by the breaking of the front truck of the locomotive, the engine being overturned. Two passengers were injured.

14th, on St. Louis & San Francisco, near Joplin, Mo., a mixed train was derailed by the breaking of a truck and a passenger car and one freight car fell down a bank. Three passengers and one brakeman were injured.

20th, on Delaware & Hudson, at Winton, Pa., one truck of a car in a passenger train was derailed by the pulling out of a drawbar and by the sudden stoppage of the train, by the automatic application of the air-brakes; 2 passengers and the conductor were injured.

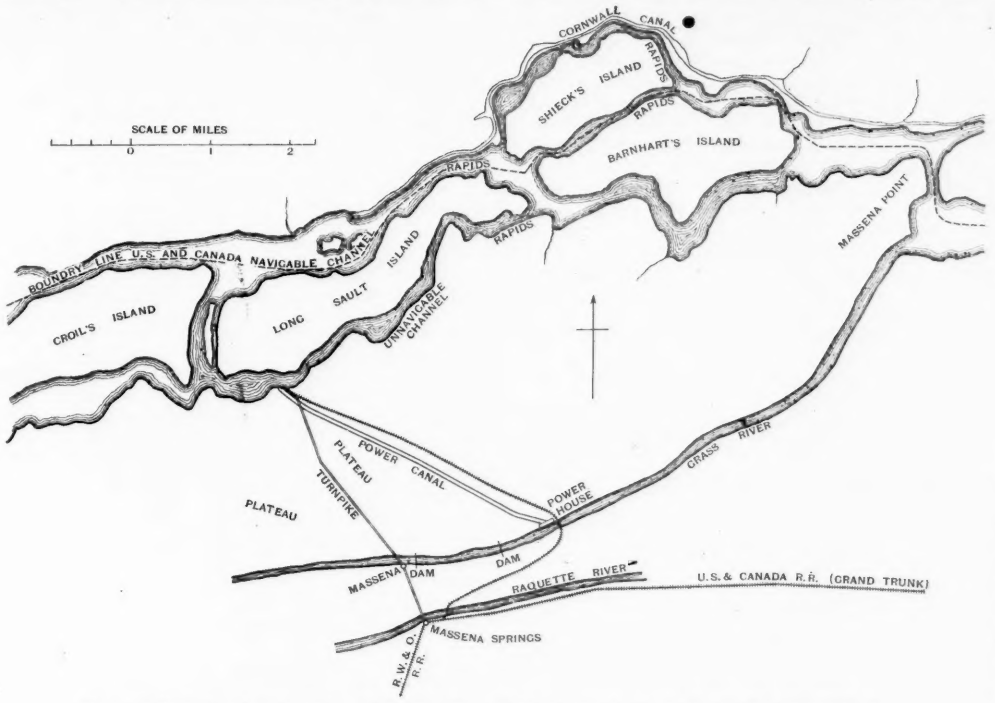


Fig. 1.—Map Showing Location of Power Plant at Massena, N. Y., near the St. Lawrence River.

28th, on Lehigh Valley near Wilkes-Barre, Pa., a freight train was derailed by a broken axle. A brakeman was killed and another injured.

29th, on Oregon Short Line, near Glenn's Ferry, Idaho, a passenger train was derailed by a broken axle and 2 passengers were injured.

And 8 others on 7 roads, involving 1 passenger train and 7 freight and other trains.

NEGLIGENCE IN OPERATING.

17th, 10 p. m., on Chicago, Milwaukee & St. Paul, at Kinzie street, Chicago, a westbound suburban passenger train moving at a low speed ran off the end of the track at an open draw, and the engine and smoking car fell into the river. The engineman and fireman jumped into the water and were rescued. Three trainmen and 3 passengers were slightly injured. There was neither interlocked signal nor derailing switch at the draw.

And 1 other involving 1 freight train.

UNFORESEEN OBSTRUCTIONS.

10th, 1 a. m., on Boston & Maine, near Exeter, N. H., the engine and 7 cars of a freight train were derailed and wrecked at a washout, and the engineman and 2 brakemen were killed. The fireman was badly burned.

30th, on Pittsburgh & Lake Erie, near West Newton, Pa., a freight train with the engine at the rear was derailed on a trestle bridge by running over a steer, and the conductor and one brakeman, riding on the foremost car, were thrown off. The brakeman was killed and conductor injured.

And 4 others on 3 roads, involving 1 passenger train and 3 freight trains.

UNEXPLAINED.

19th, on Oregon Short Line, near Shoshone, Idaho, a circus train was derailed and 5 cars were ditched. Two passengers were injured.

21st, on Baltimore & Ohio, at Williams, Pa., the caboose and one car of a freight train which were left standing upon the main track while some switching was being done, were by some means started and ran uncontrolled about 18 miles to Cumberland, Md. A brakeman in the caboose was asleep and remained so during the whole of the 18-mile trip. When the loss of the cars was discovered by the conductor of the train the engine was started after them, but had not gone far when it was derailed on a curve.

21st, on Philadelphia & Reading, near Lenhartsville, Pa., the engine and first two cars of a mixed train were derailed and fell down a bank; engineman, fireman and one brakeman injured.

23d, on Chicago, Burlington & Northern, at Aiken, Ill., a freight train was derailed and the engine and several cars were wrecked. A brakeman was killed.

28th, on Philadelphia & Reading, at Blandon, Pa., a car in a freight train was derailed and several cars were ditched. A brakeman was killed.

And 17 others on 16 roads, involving 5 passenger and 13 freight and other trains.

OTHER ACCIDENTS.

7th, on Illinois Central, at Chicago, Ill., a car of a passenger train was badly damaged by a rail projecting from a platform car standing on an adjoining track which escaped control of the workman just as the passenger train came along. One passenger and three of the workmen handling the rails were injured.

26th, on Atchison, Topeka & Santa Fe, near Bazine, Kan., a rupture or explosion of the firebox of the locomotive of a freight train blew the engineman and fireman off into the ditch and both of them were badly injured, the fireman fatally.

And 1 other involving 1 passenger train.

A summary will be found in another column.

Power from the St. Lawrence.

Work has recently been begun on the plant of the St. Lawrence Power Co., near Massena, N. Y. At this point the St. Lawrence River is divided by Long Sault Island into two channels, with rapids having a fall of over 50 ft. near the lower end of the island. About three miles to the southeast of the St. Lawrence and running nearly parallel to it is the Grass River. The level of this river, which empties into the St. Lawrence about 5 miles below the rapids, is about 45 ft. lower than that of the St. Lawrence above the rapids. The land lying between the two rivers is a comparatively level plain. This plain ends in a steep bluff, which has a fall of 45 ft. to the edge of Grass River. Across this plateau a canal is being dug with the purpose of using the difference in level between the two rivers as a water power head.

The volume of the water passing down the St. Lawrence is enormous, while that of the Grass is quite small, hence the possibility of carrying a large amount of water from one river to the other without materially changing the quantity passing down the Long Sault Rapids, and so navigation down the St. Lawrence through the North Channel at Long Sault Island will not be interfered with. Boats going up the river pass around the rapids through the Cornwall Canal.

The place selected for the head of the power canal is near the upper end of Long Sault Island, immediately

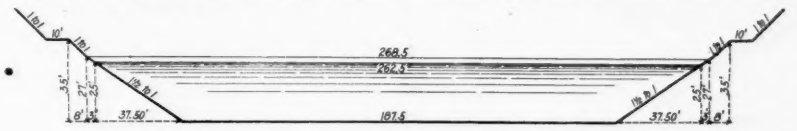


Fig. 6.—Section of Power Canal.

below a slight promontory which deflects the ice and drift coming down the river toward the opposite shore. The canal runs from here diagonally across a nearly level plateau a distance of three miles to the place chosen for the power-house. The line of the canal is nearly straight, as will be seen by the map, Fig. 1. In its course, however, it passes through two small hills. The canal will have an average width of 225 ft. and a depth of 25 ft., and will be entirely in cutting. The amount of material to be removed is great, but the cost will be moderate, since the plain is of alluvial formation, the material being sand, clay and gravel. A cross section of the canal, work upon which is now in progress at several points, is shown in Fig. 6.

The head of the canal will be protected by gates which will be so arranged as to allow the passage of large lake vessels into the canal. Should it be deemed desirable in the future to build a lock at the foot of the canal below the power-house, this would give a passage for vessels around the Long Sault rapids of the St. Lawrence.

The canal will be of sufficient size to carry water enough from the St. Lawrence across to the Grass River to develop 150,000 H. P. Before the close of 1898 it is expected that one-half of this will have been developed.

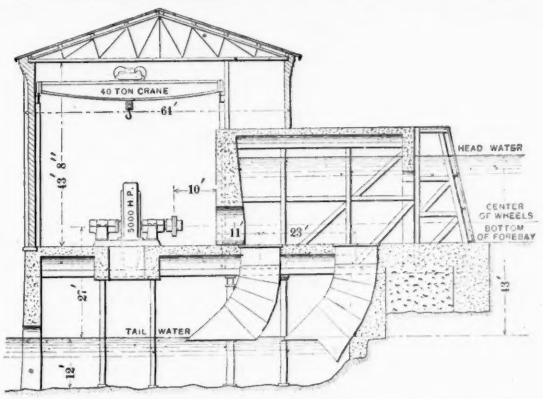


Fig. 2.—Cross-Section Through Power-House and Intake Canal.

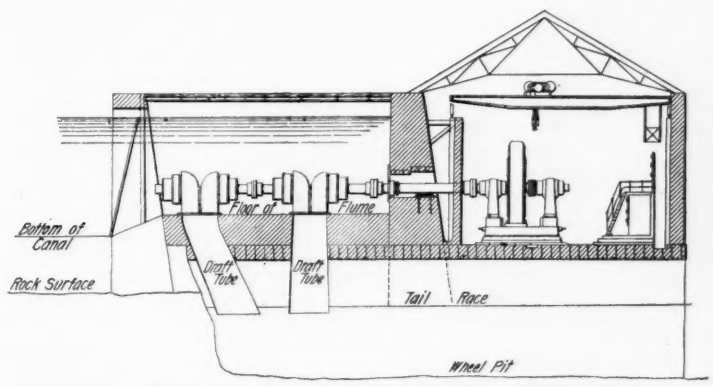


Fig 4.—Generating Plant—Elevation Through AB.

This power will be generated by turbines of the Victor type, which, with the generators, will be put in a power-house built beside Grass River. This river has an average width of from 300 to 400 ft. It runs through a limestone channel, the rock in the bed of which will be dug out to give ample section, for the outflow of water from the turbines. At the base of the bluff, the limestone formation extends like a table only a few feet above the water and on this solid rock foundation the power-house will be built. Fig. 2 shows a section through the power-house and intake canal, Fig. 3 shows the arrangement of the machinery and Figs. 4 and 5 sections. This power-house will be between 500 and 600 ft. long and 130 ft. wide, and its highest point will be about 60 ft.

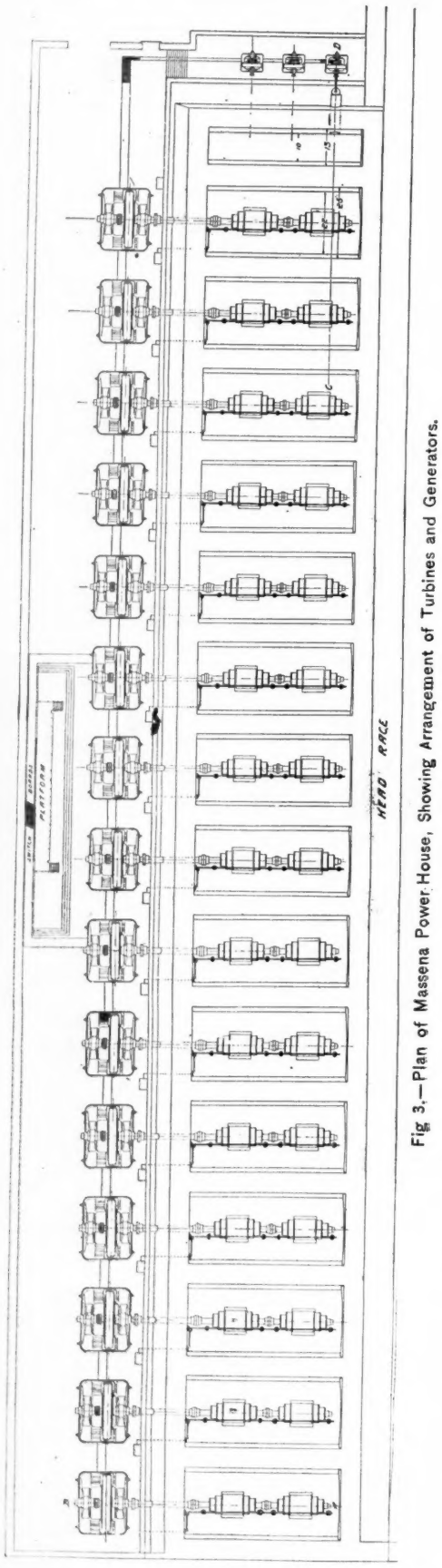


Fig. 3.—Plan of Massena Power House, Showing Arrangement of Turbines and Generators.

above the water of the Grass River. An 85-ton electric crane will run its entire length.

The water from the canal enters the turbine chambers through screens and, after passing through the turbines, runs by a separate passage for each set of turbines under the floor of the power-house and out into the Grass River. There will be two twin turbines on each shaft. By means of draft tubes on these an absolute head of over 40 ft. is obtained. The horizontal shaft of the turbines is extended through the wall of the turbine chamber and into the power-house where it becomes the shaft of the electric generators, making length of the shaft about 80 ft. Each set of turbines will develop 5,300 H. P. which will be transformed by the generators into 5,000 electric H. P.

In the power-house, now being built, there will be 15 of these units, giving a total output of 75,000 electrical horse-power, the contract for which has been placed with the Westinghouse Electric & Manufacturing Co. Each of these machines will weigh about 350,000 lbs., and occupy a floor space of 396 sq. ft. The top of each will be 22 ft. above the top of the foundations. The shaft of a dynamo, which together with that of the turbines will be about 80 ft. long, will carry a steel ring similar to a fly-wheel, and this steel ring will carry at its circumference 20 external projecting pole pieces. The ring and the pole pieces are to be of one solid casting. The ring is to have an extreme diameter of 15 ft., and will be about 3 ft. wide, and supported from the shaft by a massive cast-iron hub with ten spokes. Around each of the projecting pole pieces there will be a coil of copper strap insulated with mica and by means of these coils the poles are magnetized. This steel ring with its projecting poles revolve inside of a stationary cast-iron ring, whose inner surface is made of plates of thin soft steel on edge. In slots cut in these steel plates copper bars are laid parallel to the shaft of the dynamo. These bars are insulated with mica and form the armature of the generator. The machines will be built for a speed of 180 revolutions a minute, at which speed the three-phase current generated will reverse 3,600 times each minute.

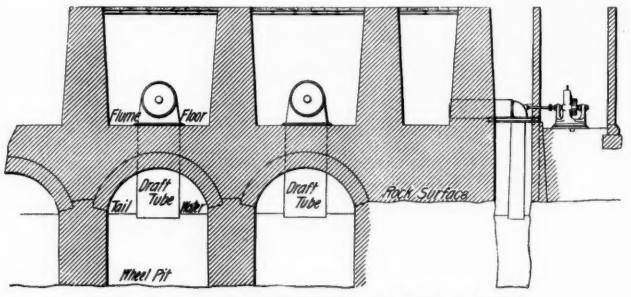


Fig. 5.—Generating Plant—Elevation Through CD.

Besides the large turbines and generators there will also be in the power-house three separate turbines of smaller power to run three small dynamos which are required to excite the poles of the larger generators. The location of these will be at the end of the power-house represented in Fig. 3.

Contracts have been made with the following companies for the building of the plant:

Excavation of canal, building of power-house, intake and outlet construction, etc., with the Lehigh Construction Co., Limited, of South Bethlehem, Pa. Fifteen 5,000-H. P. generators, the Westinghouse Electric & Manufacturing Co., of Pittsburgh, Pa. Fifteen 5,000-H. P. turbines, with the Stillwell-Bierce & Smith-Vaile Co., of Dayton, O.

The St. Lawrence Power Co. is incorporated under the laws of the state of New York, with a capital of $6,000,000. The officers of the company are: Wm. C. Lane, President; S. H. Gardyne Stewart, Vice-President; Carlton H. Reeve, Secretary, and Wm. C. Cox, Treasurer Bonds to the amount of $3.000,000 have been issued, with the United States Mortgage & Trust Co., of New York, and Messrs. Matheson & Co., the London bankers, as co-trustees.

The engineering work of this company is under the charge of John Bogart, Esq., of New York, and Messrs Kincaid, Waller & Manville, of London, as consulting engineers.

The town of Massena is reached by the Rome, Watertown & Ogdensburg and Grand Trunk lines, and the Vermont Central, which is only six miles away, may build to the town.

Electric and Elevated Cars on the Brooklyn Bridge.

A special meeting of the Board of Directors of the New York & Brooklyn Bridge was held on Thursday of last week to consider the question of permitting the elevated and street railroads of Brooklyn to run their cars over the bridge. It was reported at the meeting that the street and elevated railroad engineers and the Chief Engineer and Superintendent, C. C. Martin, had reached an agreement whereby the bridge could be made to satisfactorily accommodate both the electric and elevated cars that now run to the Brooklyn terminus. A general plan of agreement was reached some time ago and formed the basis of the final agreement approved by the Board at the meeting.

The plan, which must be agreed to by the elevated and electric railroad companies before the 24th of this month, is briefly as follows. The tracks for the electric cars are to occupy the necessary space in the present driveway, thus limiting the width for carriages to 10 ft. Each car passing over the bridge must pay a toll of five cents for the round trip, and all risks of damage done to passenger or property must be assumed by the electric railroad companies. At the New York terminus, Mr. Martin's plan is to build a deck above the present station, and the tracks which bring the cars upon this deck to have four loops, and each loop to be long enough to hold two cars at one time. To reach the loops it is proposed to build 12 passenger elevators. The two at the southwest corner and one at the northwest corner, next the Third avenue elevated, will serve only the level of the first gallery deck; thus affording easy access to the New York elevated cars; the other nine will go to the street level. The construction work on the electric roads must be begun within 10 days after the agreement is signed and finished within six months. A $100,000 bond will be required of the electric railroad companies and a $50,000 bond from the Kings County Elevated, and one of equal amount from the Brooklyn Elevated. The elevated roads must begin work within 60 days and the Brooklyn Elevated must be ready in 10 months to run cars over the bridge, while the Kings County Elevated will have two months longer in which to complete the work.

It is estimated that it will be necessary for the electric roads to expend about $600,000 to make the necessary additions and changes for the new service, and over twice that amount will be expended by the elevated roads. Each car on the elevated road will be required to pay a toll of 12½ cents a round trip on the bridge, and if the bridge trustees should at any time require the elevated roads to furnish their own power to operate the cars on the bridge, but five cents will be charged for the round trip. The elevated roads will furthermore be required to meet every condition of the Bridge Board, which means, among other things, that each train must be provided with the grips and electric motors approved by the bridge engineers.

It may be surmised that if the contracts go into effect and the changes are made some very interesting and important points must be decided upon by the elevated roads. In the first place, in view of the large expenditure of money for electrical apparatus necessary before the cars can go over the bridge, it would seem that the elevated roads must use electricity as a motive power if economy of operation is to be secured. A question that the outsider may ask is, how will the elevated roads gain anything by this large expenditure of money without an increase of the present rate of fare? Of course the only way that any return of money expended can be obtained is by an increase of traffic, which the elevated roads are confident will result from the better service. Before discussing these and other questions at length, however, it may be well to wait until the agreement has been signed.

Illinois Railroad Commissioners' Report.

The Railroad & Warehouse Commissioners of Illinois, Messrs. W. S. Cantrell, Thomas Gahan and George W. Fithian, have issued the 26th annual report of the Board. It is dated Dec. 1 and contains statistics to June 30, 1896, the principal part of the report being, therefore, over a year old. The Commissioners have made personal examination of every railroad in the state and seem to hold, though not in very clear language, that a few roads were found in such poor condition as to be hardly safe. The powers of the Board relative to enforcing improvements of roadway and equipment are declared to be ineffective, the circuitous processes required by the law making prompt execution of orders impossible. The Supreme Court of the state sustained the Commission in ordering the St. Louis, Alton & Terre Haute to increase passenger service on the Eldorado Division, which had been held by Commission to be insufficient. The Commissioners altered their official freight classification to remedy the discrimination complained of by Chicago merchants, arising from the use of another classification on shipments coming from other states (Ohio, Indiana and Michigan). The Commissioners remind the public that it is out of the question for them to prescribe uniform freight rates as low as some of the rates produced by competition.

Illinois requires interlocking signals at grade crossings of railroads, wherever the Commissioners deem it necessary, and the Commissioners report that there is considerable friction between railroads as to the apportionment of expense. The Commissioners believe that an equal division, as between companies, without regard to the amount of business done by the respective roads, is the only just and equitable basis.

The report of Dwight C. Morgan, Consulting Engineer of the Commission, discusses the operation of the interlocking signal law during the past eight years. Great progress has been made, mostly by voluntary action of the companies. In the four years from 1889 to 1893, 65 signal plants were put in at crossings, with 1,057 levers; during the past four years (1893 to 1897) 63 plants were put in, with 2,018 levers. This increase of about 100 per cent. in the average working capacity of the machines is held to show the increased appreciation among railroad officers of the usefulness of interlocked signals. The quality of the work and apparatus has been greatly improved. In 1893 the state regulations were revised, a committee of railroad officers assisting, and since that time no controversies have arisen regarding the interpretation of the rules. The rules may need further amendment as changing conditions lead to higher development.

Crossings of electric street railroads have been rapidly multiplied and have introduced a serious additional danger. The grade-crossing laws should be made more comprehensive so as to suitably regulate these crossings

and insure safety. The state should supervise the maintenance and operation of interlocking signals as well as their construction.

The volume contains the usual statistical tables of the traffic, earnings, expenses and operations of the railroads, and also statistics warehouses. The report of the grain inspection department takes up about 70 pages of the book.

A Very Fast Regular Train.

We have recently published the fact that the Philadelphia & Reading is running a very fast regular passenger train on the Atlantic City Railroad from Philadelphia to Atlantic City. In times past very fast service has been given on this road and some extremely good runs have been made, but we believe no train has ever before been run in regular service on that road which was scheduled so fast as this (64.04 miles an hour); and, in fact, we know of no such fast schedule anywhere in the world.

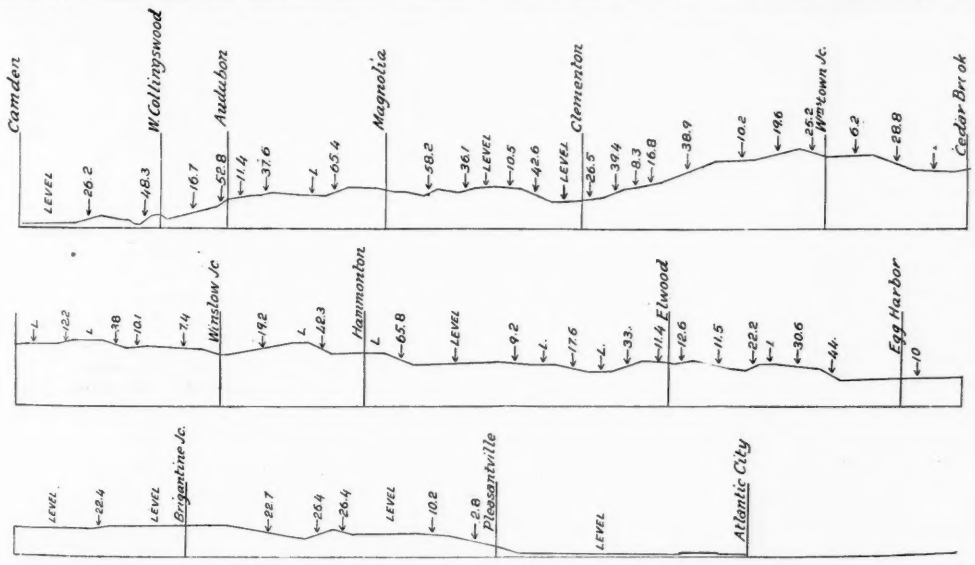
The regular runs of this train began July 2, and up to the date of our information, Aug. 4, the train has been on time every trip. The distance from Camden to the Atlantic City station is 55.5 miles. The train consists of five or six cars. The actual time of running from terminus to terminus for 26 days, as shown on the sheet published herewith, is 47 or 48 minutes, which gives a speed of 70.8 and 69.4 miles an hour, a considerable improvement on the schedule, which is made necessary by the inability of the ferry-boat to cross the river from Philadelphia in the time allotted. Getting out of Camden some miles must be run at comparatively low speed, and speed is reduced at the Atlantic City end some distance before the end of the run is reached. We have taken, therefore, the runs between West Collingswood and the Meadow Tower as showing fairly the speed in motion. For the 26 days the time averages 41.3 minutes. The shortest time is 40.5 minutes and the longest 42 minutes. The distance is 50.7 miles. For the average time the speed is 73.7 miles an hour. The slowest is 72.4 miles and the fastest 75.1. Of course this does not represent the highest speed reached. Taking the run between Hammonton and Pleasantville, 22.9 miles, the time varies from 17 to 18.5 minutes. At 17 minutes the speed is 80.8 miles an hour, and at 18½ minutes it is 74.3 miles an hour. Considering the profile, which is also printed herewith, the weight of the train and the regularity of its performance, this is a splendid record, and probably a record unequaled by a regular train of that weight.

It will be observed that the engine making the July record was No. 1027. Engravings and a description of this engine appeared in our issue of June 19, 1896, at which time we gave tables of some of the performances of this locomotive and its mate, No. 1026. The locomotive is of the Atlantic type, being a Vauclain compound, built by the Baldwin Locomotive Works. The cylinders are 13 and 22 × 26 in., the drivers are 84¼ in., the total weight is about 143,000 lbs. and the weight on drivers about 78,600 lbs. The total heating surface is 1,835.1 sq. ft. The reader will probably remember that the Atlantic type has four drivers coupled, a four-wheeled truck forward and a large two-wheel trailing truck under the firebox. These particular engines have Wootten fireboxes.

ATLANTIC CITY RAILROAD—RECORD OF TRAIN NO. 25, JULY, 1897—ENGINE NO. 1027.

The second column gives the distance in miles. The other columns give date and time in hours and minutes.

Stations.	Distance.	2d.	3d.	5th.	6th.	7th.	8th.	9th.	10th.	12th	13th.	14th.	15th.	16th.	17th	19th.	20th.	21st.	22d.	23d.	24th.	26th.	27th.	28th	29th	30th	31st.
Camden (Kaigns Pt.)	.0	3:50½	3:50¾	3:50½	3:50¾	3:51	3:50½	3:49½	3:49½	3:49¼	3:49	3:49½	3:50¼	3:51½	3:51½	3:51	3:51	3:50¾	3:50	3:49½	3:49	3:49	3:49½	3:48¾	3:49	3:49	3:50
Camden (Bulson St.)	1.3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Collingswood	3.1	3:55	3:55	3:55	3:55	3:56	3:55	3:54½	3:54	3:54	3:54	3:54	3:54½	3:56	3:55½	3:55	3:55½	3:56	3:55	3:54½	3:54	3:54	3:54	3:53½	3:53½	3:54	3:55
Audubon	4.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haddon Heights	5.5	3:57½	3:58	3:57	3:58	3:58	3:57½	3:57	3:57	3:56½	3:56½	3:56	3:57½	3:59	3:58½	3:58	3:58	3:58	3:57	3:56½	3:57	3:56½	3:56½	3:56	3:56	3:57	3:57½
Magnolia	7.9	4:00	4:00	4:00	4:00	4:00½	3:59½	3:59½	3:58½	3:59	3:58½	3:59	3:59½	4:01	4:01	4:00	4:00	4:00½	3:59½	3:59	3:59	3:59	3:59	3:58	3:58½	3:59	3:59½
Stratford	10.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Laurel Springs	10.6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clementon	12.0	4:03	4:03½	4:03¾	4:03	4:04	4:02¾	4:02½	4:02	4:02	4:01½	4:02	4:02½	4:04	4:04	4:03	4:03	4:03½	4:02	4:02	4:02	4:02	4:02	4:01	4:01½	4:02	4:03
Williamstown Junction	17.0	4:07½	4:08	4:07½	4:07	4:08	4:07¼	4:06½	4:06	4:06	4:06	4:06	4:06¼	4:08	4:08½	4:07	4:07½	4:07½	4:06	4:07	4:06	4:06	4:06	4:06	4:06	4:06	4:07
Cedar Brook	19.9	4:10	4:10¼	4:10½	4:10	4:10½	4:09½	4:09½	4:09	4:09	4:08½	4:08½	4:09½	4:10½	4:11	4:09½	4:09¾	4:10½	4:09	4:09	4:09	4:09	4:09	4:08	4:08½	4:09	4:09½
Winslow Junction	24.5	4:13½	4:14	4:14	4:13½	4:14	4:13	4:13	4:12½	4:13	4:12½	4:12	4:13	4:14	4:14	4:15	4:13	4:13	4:14	4:12½	4:12½	4:12½	4:12½	4:12	4:11¾	4:12	4:12½
Hammonton	27.6	4:16	4:16½	4:16½	4:16	4:16½	4:15½	4:15	4:15	4:15	4:14½	4:14½	4:15	4:17	4:17½	4:15½	4:16	4:16½	4:15	4:15	4:15	4:15	4:15½	4:14	4:14½	4:15	4:15
Elwood	33.8	4:20½	4:21	4:21	4:20½	4:21½	4:20¾	4:20¼	4:20	4:20	4:19¾	4:19½	4:20	4:21	4:22	4:20	4:20½	4:21	4:19¾	4:20	4:19½	4:20	4:20	4:19	4:19	4:19¼	4:20
Egg Harbor	38 7	4:25	4:25	4:25	4:24	4:25	4:24½	4:24	4:24	4:24	4:24	4:23½	4:23½	4:24½	4:26	4:24	4:24	4:25	4:23½	4:24	4:24	4:24	4:24	4:23	4:23	4:23	4:23½
Brigantine Junction	43 5	4:28½	4:29½	4:29	4:28	4:29	4:28	4:28	4:28	4:28	4:27	4:27	4:27	4:28½	4:29½	4:27½	4:28	4:29	4:27	4:27½	4:27	4:27½	4:28	4:27	4:26½	4:26½	4:27½
Pleasantville	50.5	4:34½	4:35	4:34	4:34	4:35	4:33	4:33	4:33	4:33½	4:33	4:32	4:33	4:34	4:35¼	4:32½	4:33½	4:34¾	4:32¾	4:33	4:32½	4:35	4:33½	4:32½	4:32½	4:32	4:33
Meadow Tower	53.8	4:37	4:37	4:37	4:36½	4:37	4:35½	4:36	4:36	4:36	4:35½	4:34½	4:35	4:36½	4:37½	4:35½	4:36	4:37	4:35½	4:36	4:35	4:36	4:36	4:35½	4:35	4:35	4:35½
Atlantic City Depot	55.5	4:38½ P.M.	4:38½ P.M.	4:38 P.M.	4:37¾ P.M.	4:38½ P.M.	4:37½ P.M.	4:37½ P.M.	4:37½ P.M.	4:37½ P.M.	4:37 P.M.	4:36 P.M.	4:39 P.M.	4:38½ P.M.	4:39½ P.M.	4:38 P.M.	4:38 P.M.	4:38½ P.M.	4:37½ P.M.	4:38 P.M.	4:38 P.M.	4:39 P.M.	4:38½ P.M.	4:38 P.M.	4:38 P.M.	4:37 P.M.	4:38 P.M.
Number of cars	.....	5	5	5	6	5	5	6	6	5	5	5	5	5	6	5	5	5	5	6	6	5	5	5	6	6	6



Profile of Atlantic City Railroad—Philadelphia & Reading Railroad.

A Day's Work Under the State.

The Prussian State Railroads have recently issued regulations concerning the maximum limits of the time railroad employees engaged in the outdoor service may be on duty daily. By these the day's tour of duty is defined to be the service between two periods of at least eight hours of time off duty. For trainmen the periods off duty are to be 10 or 6 hours, according as it falls at the employee's home or away from it. The tour of duty includes the time when the employee must be ready for duty, and all short rests.

The longest permissible tour of duty is to be: For trackwalkers on sections where the service is by day, or a short time in the night, 14 hours. Only when the train service is so simple that the trackwalkers have during their tour of duty repeated intervals of rest for a considerable time, as on branch lines with light traffic, may the time between going on and off duty be extended exceptionally to 16 hours. The same rule holds where the tour of duty is interrupted by a rest of several hours.

On sections where the duty is wholly by day or by night the trackwalker's regular day's work may not last more than 13 hours, except that when the men are changed it may be extended to 14 hours. If the walkers cannot find quarters near their work, allowance must be made for going and coming.

Switchmen not engaged in central switching cabins, whose time is so taken up that there are no considerable interruptions in their activity, must not remain more than eight hours constantly on duty. When the traffic leaves the switchman free for considerable and numerous intervals, his day may be 12 hours, and on the days men are changed 14 hours. Exceptionally, when after eight hours service the switchman has complete rest for four hours, his day's service may be extended to 16 hours. Switchmen employed in central switch and signal stations where they are constantly busy must not serve more than eight hours per day.

Stationmen engaged in outdoor service where the traffic, train shunting, etc., leaves them no appreciable time for rest, must not serve more than eight hours. Otherwise the daily service of stationmen may last 12 hours, and when men are changed, 14 hours. When the traffic is simple, as on branches with light traffic, leaving considerable periods of rest between trains, the time they are on duty, including these periods, may be extended exceptionally to 16 hours.

Telegraphers, where they are constantly and strenuously engaged, may not serve more than eight hours. In other cases they follow the rule for stationmen.

Men engaged in making up trains, where constantly busy, may not serve more than 10 hours. Otherwise their day may be extended to 12 hours, and the day of changing men to 14 hours.

The car master's day is 12 hours; the day when relieved, 14 hours.

The trainmen's service is to be so arrrnged that the average service per day of each man may not be more than 11 hours. How much less the special circumstances may make advisable must be decided by the officials in charge at the beginning of the period of service. The fixing of single tours of service as long as 16 hours can be permitted only when there are considerable resting-spells during the tour of service, or the requirements of the service are so simple that, in the judgment of the officials in charge, there is no risk of over-exertion. Enginemen and firemen must not be given trips which keep the engine running more than 10 hours. When a tour of service has lasted 14 or 16 hours, it should be followed by a longer rest than usual at home, which rest should be, so far as possible, between 7 in the evening and 7 in the morning. The time of a tour of service must include the time before and after the trip that the man is required to be on hand.

Exports of Pig Iron.

Since the first definite statistics on the subject of foreign pig iron shipments were kept, beginning Nov. 1, 1896, there has been shipped from the Birmingham District 138,870 tons to July 1, 1897. Sixty per cent. of this tonnage has been shipped via Norfolk and the Southern Railway. The importance of this movement and its steady increase are shown by the following figures:

Exports via Norfolk.		Total foreign shipments.	
January	254 tons	All ports	7,696 tons
February	4,200 "		6,664 "
March	5,588 "		10,300 "
April	10,000 "		19,424 "
May	7,900 "		16,213 "
June	12,000 "		17,657 "

The table below shows the average maximum ocean rate from Norfolk to

Liverpool	$1.15	Bristol	$1.60
Manchester	$1.29 to 1.40	Glasgow	1.75
Hamburg	1.50	Antwerp	1.90

Approximately 30,000 tons of pig iron are now booked for movement during the cotton season, and the prospect is that this tonnage will reach 50,000.

The export rail rate on pig iron fron Birmingham to Norfolk is $2.21. The rail rate from Birmingham to Pensacola and Mobile on export iron is $1 per ton, and to New Orleans $1.60 per ton. The pig iron shipments from these ports have been light—first, on account of the small tonnage; second, the absence of a diversified cargo, and third, for the reason that these ports handle almost exclusively Liverpool and Manchester freights. The large shipments of grain and packing-house products and other dead-weight freight, via New Orleans, prevent the necessity for pig iron that exists at Norfolk.

Approximately 65 per cent. of the foreign tonnage of pig iron moving from Southern ports has gone to the continent. Hamburg and Rotterdam have been the largest regular purchasers. Could space be had at this time to Liverpool and Manchester a heavy tonnage would move.

Foreign Railroad Notes.

The Austrian Railroad Minister has issued a circular to all the railroad managements of the country recommending them to grant a yearly vacation of two weeks to all regular employees, which is in accordance with the practice of the State Railroads for some years past.

The gross earnings of the Russian railroads in 1896 were 6½ per cent. greater than in 1895 and amounted to $9,102 per mile of road, against $9,695 in 1895, the mileage having increased.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

It has been discovered that under the new tariff law the United States imposes a discriminating duty of 10 per cent. *ad valorem* on goods imported through Canada or Mexico from a third country. Thus the importation of goods from Japan over the Canadian Pacific, for instance, will probably be absolutely shut off, the duty being, even in the case of very cheap goods, more than the railroad can afford to reduce its rate below that of the lines from the Pacific coast, whose roads lie wholly within this country. Washington press dispatches say that this addition to the discrimination clause was made at the request of Representative Towney of Minnesota, and was intended to put a stop, as far as possible, to all traffic over Canadian railroads which is competed for by roads in the United States. The clause appears to have been carelessly accepted by Congress without discussion. The payment of duties will, of course, be contested, and the Treasury Department will ask the Attorney-General to interpret the law; but the language is clear, *and if the Attorney-General follows the example set by the Supreme Court in the Anti-Trust law case, and strictly construes it, he can hardly fail to sustain it. In a tariff law no one expects justice and equity to receive consideration and so this outrageous law seems likely to stand. We do not condemn the law because its results will be harmful to the Canadian Pacific or the Grand Trunk, for we do not know that they will; it has always seemed to us that the transcontinental traffic taken by the Canadian roads in competition with American lines must have afforded exceedingly slim profits; but the law is outrageous in principle. The newspapers which tried to arouse public interest in the alleged harmful competition of the Canadian railroads two or three years ago now say that the question "has long agitated the Treasury Department," but there is no evidence that the "agitation" was of any consequence except in the columns of the aforesaid newspapers. It is readily imaginable that the Northern Pacific, or the Great Northern, or the Union Pacific, would be glad to kill off Canadian Pacific competition, but this sentiment, so far as it is legitimate, is just the same as would be felt toward a similar competitor this side of the boundary, and the attempt to make out of it a question between the United States and Canada, political or other, was wholly unjustified. The assertion that the Canadian road violated the long and short haul rule was denied; and in any event such violation was probably no worse in Canada than in this country. If the Intercontinental Railroad were built and running, a shipment from Gautemala over it would have to be taxed the 10 per cent., while one from Mexico, in the same train, could come in free. This is about as fair as to tax French Canadians coming into New England wearing red shirts while those wearing blue ones were let in free.

* Sec. 22. That a discriminating duty of 10 per centum ad valorem, in addition to the duties imposed by law, shall be levied, collected and paid on all goods, wares, or merchandise which shall be imported in vessels not of the United States, or which, being the production or manufacture of any foreign country not contiguous to the United States, shall come into the United States from such contiguous country. . . .

Better Whistle Signals.

Mr. Sullivan, General Superintendent of the Illinois Central, suggests four changes in the whistle signals of the standard code, and his sugges ions are published in the *Chicago Record*. For "off brakes" (Rule 341) he would have two short blasts, instead of two long; for the flagman to go back (Rule 347) he would blow one long and three short, instead of five short, and to call in flagman (345) he would substitute (*a*) two long blasts for four long, and (*b*) one long, one short, one long, one short (— ▪ — ▪) for the other calling-in signal. In giving his reasons for advocating a change Mr. Sullivan says:

"It is contended that in the formulation of audible signals the number of sounds used and not the length of such sounds should control the character of the signal, and the lines along which signals should be formed are the 'instantaneous' or the 'rhythmical.'

"The lengthening of the sounds should be reserved for purpose of emphasis or to give carrying power where the signals are to be conveyed to a distance.

"Signals of an emergent character should be short, sharp, quick and decisive, with a rapid rhythm.

"Signals of information or of non-emergent action may be made up of longer sounds, adjusted to slower rhythm.

"Signals made up of three or a lesser number of short sounds may be classed as 'instantaneous,' for the reason that they can be quickly given, and no conscious mental effort is required to comprehend their meaning, the effect or impression being at once grasped by the mind, and action may instantly follow.

"Signals made up of more than three sounds are not so easily understood, and when formed, as in the existing code, of four, five or six sounds, require an accurate count to determine the purpose for which the signal is given. To insure such count being made requires that attention shall be fixed upon the signal from the utterance of the first sound, and any other sound or incident which may detract attention from the count jeopardizes the purpose of the signal. There is probably no form of signal more difficult to comprehend than one made up of a monotonous repetition of sounds.

"For this reason the introduction of rhythm in audible signals is suggested as a condition necessary to the development of a satisfactory system.

"A rhythm founded upon the signals representing 'danger,' 'safety' and 'caution' as the primary elements establishes a simple and effective means of eliminating monotony of sound and of giving to each signal individuality of expression, with the result that the scope of audible signals may be enlarged without complication by introducing a system based upon the compounding of simple sounds."

As Mr. Sullivan is a member of the Train Rules Committee of the Association he is sure of an attentive hearing, and as he is good at stating an argument his propositions ought to receive an intelligent vote, even if they should happen to come before the meeting within half an hour of dinner time. Whether they will find favor with a majority is another question.

On its merits the first change (Rule 341) ought to receive prompt approval, though this American Railway Association has ample inertia and the particular rule has a ten years' accumulation of it, tending to maintain it as it now stands. But there is no evidence that practice everywhere conforms to the rule (in the case of some rules there is evidence that practice does *not* conform to them), and changes more radical than this have been carried in the association on several occasions without much effort. To change from long to short blasts would on some roads (we do not know but a majority) simply be going back to the former more natural practice.

An engineman does not order brakes released until the moment that it is safe and proper to proceed and when that moment arrives he should not waste even the three or four seconds that are required to make two long blasts. If he has a heavy train, that interval may make the difference between getting stuck and not getting stuck. With short blasts, the engineman can suggest how much of a hurry he is in, while with long ones he cannot. We forget what arguments were offered in favor of long blasts when the code was adopted; but the principal one, that with short blasts this signal may be confused with the answering signal, is, we believe, worthy of very little consideration. Certainly its importance is growing less daily, with the increasing use of air brakes and of the space interval.

These two improvements tend to relegate whistle signals more and more to yard use, and in yards an important desideratum in all whistle signals is brevity. Indeed, we surmise that this last point may have been Mr. Sullivan's main reason for desiring a change. Every superintendent with lines in large cities must experience a constantly growing necessity for making locomotives as noiseless as possible, and this change will be a material help in that direction.

The other changes aim simply to make it easier to count the blasts, and seem to us sensible. We should think every superintendent who reads Morse telegraph characters would be inclined to favor them. Every operator can testify to the fact that J and B are pleasanter to the ear than 5 or ¶, and easier to read than P. Each of these signals (345 and 347) could be repeated without exasperating the residents along the road (provided the "long" blasts were made not over 1½ seconds in length) and there could not be much objection to adding to the rule a requirement that they be made at least twice in every case, except where the engineman could plainly see the repetition was not necessary.

Mr. Sullivan's suggestion that enginemen should be enabled to emphasize signals by prolonging the sounds will strike every one as eminently practical. In the old days when passenger trains had to be kept out of danger by skillful "blowing for brakes" this power was a material element in the prompt and safe handling of trains, and it served as well to give brakemen and other people a vivid idea of the state of the engineman's temper that was not without a certain human interest!

Ticket Scalpers.

The railroad companies have withdrawn their suits against the Nashville ticket brokers in the state court and will devote their energies to the prosecution of the suits in the federal courts. It is said that this withdrawal is due to the fact that Chancellor Cook, of the state court, was likely to dissolve the injunction and let the brokers go free; and the Nashville *Sun* prints the opinion which it is alleged the judge was ready to deliver. The substance of this opinion is that the conditions of the non-transferable tickets, which the railroads wish to prohibit the brokers from selling, are so sweeping that each railroad already has more power to detect and thwart frauds than a court of equity could have. The railroad, having power to make the holder of a ticket identify himself and thus prove legitimate ownership, and the right to take up the ticket if found in wrong hands, has all possible power; the company or its agent is both judge and sheriff, having, by the contract, reserved to itself all the judicial and executive power that it needs. The court could not possibly exercise any other or more effective power. Judge Cook says that the railroads' argument concerning the action of courts in patent and trade-mark cases does not show a true analogy. A court of equity will enjoin a cigar-box maker from imitating the lithograph of another maker; but suppose this infringer were compelled to present every box that he made to the owner of the true trade-mark, and the latter had a right to take up and destroy every box thus surrendered; the remedy of the rightful owner would be ample. Surely no court of equity would put forth its powers by injunction to prevent one man or all men from committing forgery, for the criminal courts have ample jurisdiction. To suppress the ticket broker, the railroads must resort to the Legislature.

From a technical standpoint this reasoning of the judge is very strong. If a conductor or an agent cannot detect a forged signature on a ticket, how can the court do any better? Judges always say that an equity court must not use the injunction except where irreparable damage would otherwise ensue; and to the legal mind it is, no doubt, very clear that the damage to a railroad from the use of a dozen or a hundred fraudulent tickets would not be irreparable. The company has the names of the buyers of all excursion tickets, and the signatures of all passengers using such tickets; let it sue them, say the lawyers. Moreover, the consequences of the fraud are no worse than the railroads are every now and then inflicting on themselves (when they make the same low rates for tickets which are freely transferable). This probably has its effect on a judge's mind; at all events it is very plausible.

The real difficulty, of course, is that the conductor has only a minute, or possibly five minutes, in which to make his investigation of tickets, and no chance to get witnesses. A court could take days or weeks, and ferret out the fraud, hunting down the different parties to it. On the other hand, a successful prosecution in the court would settle only one or a few cases and could affect the great mass of cases only by scaring the scalpers; and it is not certain that they would be scared. It appears that signing another's name to a ticket contract is not forgery. No one can question that the railroads ought to have every possible assistance from the state in preventing fraudulent use of tickets by means of false signatures and counterfeit dating stamps; but as long as there is no better avenue through which to apply to the state for assistance than a court of equity, the prospects of success must continue precarious; for in equity courts each judge who chooses to be a law unto himself has a pretty good opportunity of doing so.

The most hopeful movements against the scalpers that we have heard of recently are those at Denver and St. Paul. The very satisfactory use of the Sebastian ticket for Colorado excursions was related in the *Railroad Gazette* of July 23, page 525. By de-

priving the scalper of all opportunity to make comparison with the original signature and physical description of the passenger, which were given when the ticket was bought, and omitting to show on the going ticket the name of the place to which the return portion will be good, Mr. Sebastian seems to have succeeded in greatly chilling the ardor of the Rocky Mountain speculator. A passenger who so devotedly loves the scalper, and the "liberty" which freedom of scalping is supposed to represent, that he is ready to perjure himself by selling his ticket (and incidentally make a dollar or two), can, indeed, give the scalper a true description of himself and can write his name as naturally (or as unnaturally) as he did in the presence of the agent from whom he bought the ticket; but the scalper is obliged to take the passenger's word in regard to the return destination and to run the risk of any mistakes that he may make. And thus far he has not seen fit to take these risks. There is too good a chance for the passenger to scalp the scalper.

The St. Paul idea that we refer to is simply a scheme to prevent counterfeiting or altering the time limit of tickets, by using a cipher word to represent the date and by punching this word through the ticket. It appears that last year, when a rubber stamp was used for impressing the date-cipher on tickets, counterfeit stamps were made so quickly—within an hour or two—that the cipher became worthless as a safeguard before the day expired. The punch machine now used (similar to that used on the Chicago & Northwestern for dating local tickets) is a much more difficult thing to make and it is believed that the scalpers will not get around it so easily.

Given a few simple checks like these, and a passenger agent who really desires to starve out the scalper, and there would seem to be no reason why the dishonest scalper should not be speedily reduced to his lowest terms. Of course we do not assume that the business of ticket brokerage is going to be killed out all at once; the alleged honorable broker has too warm a place in the affections of some of the G. P. A's.

June Accidents.

Our record of train accidents in June, given in this number, includes 40 collisions, 52 derailments and 3 other accidents, a total of 95 accidents, in which 45 persons were killed and 127 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

Collisions.	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	6	0	0	6
Misplaced switch	1	1	3	5
Failure to give or observe signal	1	1	0	2
Mistake in giving or understanding Orders	0	7	0	7
Miscellaneous	5	0	4	9
Unexplained	6	4	1	11
Total	19	13	8	40

Derailments.			
Broken rail	1	Failure of brakechain	1
Loose or spread rail	1	Misplaced switch	1
Defective bridge	2	Open draw	1
Defective switch	1	Animals on track	1
Track distorted by heat	1	Washout	4
Broken wheel	2	Malicious obstruction	1
Broken axle	4	Unexplained	22
Broken truck	5		52
Fallen brakebeam	2		
Failure of drawbar	2		

Other Accidents.	
Explosion	1
Broken side rod	1
Other causes	1
	3
Total number of accidents	95

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	6	0	6	6
Defects of equipment	6	16	2	24	25
Negligence in operating	23	2	0	25	27
Unforeseen obstructions	0	6	1	7	7
Unexplained	11	22	0	33	35
Total	40	52	3	95	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	22	17	2	41
Freight and other	46	36	1	83
Total	68	53	3	124

The casualties may be divided as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Killed:				
Employees	14	17	1	32
Passengers	4	0	0	4
Others	8	1	0	9
Total	26	18	1	45
Injured:				
Employees	24	19	4	47
Passengers	46	25	1	72
Others	4	4	0	8
Total	74	48	5	127

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	0	10	9	4
Defects of equipment	0	10	3	7
Negligence in operating	4	50	14	31
Unforeseen obstructions and maliciousness	0	0	4	2
Unexplained	0	2	2	3
Total	4	72	32	47

Twenty-one accidents caused the death of one or more persons each, and 19 caused injury but not death, leaving 55 (58 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with June of the previous five years shows:

	1897.	1896.	1895.	1894.	1893.	1892.
Collisions	40	40	40	39	72	75
Derailments	52	49	55	67	96	88
Other accidents	3	5	4	4	5	2
Total accidents	95	94	99	110	173	165
Employees killed	32	14	22	22	25	44
Others killed	13	16	13	14	15	26
Employees injured	47	37	51	74	104	143
Others injured	80	19	32	20	96	156
Passenger trains involved	41	30	20	35	55	77
Average per day:						
Accidents	3.17	3.13	3.30	3.66	5.77	5.50
Killed	1.50	1.00	1.17	1.20	1.33	2.33
Injured	4.23	1.53	2.77	3.13	6.67	9.97
Average per accident:						
Killed	0.47	0.32	0.35	0.32	0.23	0.42
Injured	1.33	0.60	0.83	0.85	1.15	1.81

The worst accident in June was that at Missouri City, Mo., on the 26th, in which eight persons were drowned or otherwise fatally injured, six of them being postal clerks. The local newspapers state that before the baggage of the passengers was cleared up from this wreck several thousand dollars' worth of valuables, largely jewelry, was stolen, also much express matter, and a tin box belonging to the conductor containing $1,500 worth of valuables. A peculiarity of this case, as reported, was the ineffectual attempt of a farmer to stop the train, he having discovered the disaster to the bridge in ample season. In another accident—that at Trenton, Tenn., on the 1st—a farmer saw that the collision was impending and succeeded in mitigating its severity by stopping one of the trains.

Another disaster at a bridge was that at Chicago on the 17th, which, however, was attended by no fatal results. This accident was reported in the *Railroad Gazette* of July 2.

The month of June was marked by a half dozen collisions, attended by a variety of peculiar circumstances. The most prominent was that at West Chicago, Ill., 30 miles west of Chicago, on the 30th. The report of this collision given in the *Railroad Gazette* of July 9 appears to have been substantially correct. On the 23d there was a bad collision at Woodbury, N. J., which escaped being a disaster by the fact that the foremost train had been at a standstill so long that the passengers who had been riding in the rear car had got out to make a survey of their surroundings. The butting collision at Millersburg, O., on the 26th, due to the curious error of the conductor and of the engineman in assuming that a train 11 hours behind time probably would not come at all, would not have been fatal to the passengers, it seems, if these had not been riding in the baggage car.

The butting collision at Madden, Tex., on the 22d, seems to have been due to an engineman mistaking a white flag for a green one. Whether or not the white flags on that road are allowed to become so dirty that it requires a close examination to tell the difference between one of them and a dirty green flag, is a point on which we are not informed, but it is readily imaginable that on many railroads a mistake of this kind would be more or less excusable The accident emphasizes the advantage, over flags, of a number fixed to the front of the headlight or in the windows of the top of the caboose.

The butting collision at Vandalia, Ill., where the electric headlight missed a good chance to cover itself with glory, has already been reported (July 16).

The most deadly collision of all, though no passenger train was involved, was that near Hudson, Wis., on the 7th, where both the conductor and the engineman appear to have made the same fatal mistake; at any rate, neither one of them can very well deny that the mistake was committed right before his eyes.

Distortions of the rails of tracks by solar heat have been reported from a number of places during the month of June, and in one case, as will be seen by the record, this was the cause of a fatal derailment.

The highway crossing accident at Valley Stream, L. I., on May 31, killing five persons, was followed the next day by a somewhat similar accident at Alma, Ill., in which four were killed.

Fatal explosions of locomotive boilers were reported in June, one from Mexico and one from Newfoundland.

We have reports of eight street-car accidents in June, three of which were to cable cars in New York City; the others were in Muncie, Ind.; Scranton, Pa.; Paterson, N. J.; Hartford, Conn., and New York City. The total number of persons reported injured in these accidents is 23.

Annual Reports.

The Railroads of India.—In writing seven months ago of the results of working the railroads of India in the year 1895, we said (page 28, current volume) that 1896 must see a diminished traffic, increased loss to the state and another great example of the services of the railroads to the natives, all due to the partial failure of the crops in the Northwest. This safe and obvious prophecy confirmed by the report for 1896 now before us.

The gross earnings of the railroads of British India amounted, in 1895, to 262,369,060 rupees. In 1896 they were 253,660,425 rupees, the falling off being 8,708,635, or 3.32 per cent. This loss (much less than we should have expected) was all in freight traffic, all in diminished volume (the rate was a trifle higher) and nearly all in the movement of grain and seeds. In fact, there was a gain of 1,984,000 rupees in the passenger earnings proper, and a net gain of 628,000 rupees from passenger earnings and earnings from "other coaching traffic." The passenger miles gained 4.13 per cent. to 6,428,000,000. But the tons fell 3.44 per cent., and the ton-miles 7.2 per cent. We are informed in the text that this decrease was "owing mainly to a heavy decrease in the grain and seed traffic on account of famine," and in military stores because this item in 1895 was swollen by the Chitral expedition. "Grain and seeds" is the most important single item of traffic on the Indian railroads, and this fell off in tonnage 6.53 per cent. Wheat is but about 20 per cent. of this item; the earnings from wheat fell off 52 per cent. The exports of wheat were 20.45 per cent. of the whole crop in 1891 and only 2.31 per cent. in 1896, and the tons exported in 1896 were but 126,969. Of course this falling off in grain traffic was confined mostly to the lines in the North and Northwest. On the Northwestern system for instance, the decrease in earnings from this class of traffic was 55 per cent., while on the Midland there was a gain of about 20 per cent. and on the Eastern Bengal a gain of 55 per cent.

We have said that the gross earnings of the Indian railroads in 1896 were 253,660,425 rupees, and that the loss from 1895 was 8,708,635 rupees. Theoretically these quantities would be £25,366,042 and £870,863; that is the rupee was for many years 2s., or $\frac{1}{10}$ of a pound sterling. In fact, however, the average rate of exchange in the official year of 1895-96 was 1s. 1.6d., at which rate the 1896 earnings were only £14,410,160, so far as they were used to purchase supplies from Europe, and to pay interest in London. Of course a great part of this could be paid out in silver in the country, as, for instance, 48 per cent. went out as working expenses, but the burden of depreciated silver is still terrible. For instance in 1895-96 the loss to the state in working the guaranteed railroads was 10,329,440 rupees; but if it had been possible to remit at the contract rate of exchange the result would have been a gain of 4,128,400 rupees. In the fiscal year of 1896-97 the loss on these roads was 14,326,000 rupees and the total apparent loss to the state of railroad working and guarantees was 28,102,000 rupees. Obviously there must be another year of heavy loss to the state, for it is not to be expected that the rate of exchange will improve with the price of silver still falling; and all the effects of the famine, the plague and civil disorder have not yet been felt.

These results are the losses to the state on state-worked railroads, gurranteed and subsidized railroads, etc. In fact, the railroads in the aggregate are not worked at a loss—far from it. The results were, in lakhs of rupees (100,000 rs.):

	1896.	1895.
Gross earnings	2,536	2,624
Working expenses	1,220	1,212
Net earnings	1,316	1,412

Or, calling the rupee in 1896, 26 cents, the net earnings were 34⅛ million dollars on an average of 19,718 miles, or about $1,700 net per mile. In the United States in 1895 (to June 30) the net income from operation was $1,967 per mile. We have not yet got the figures for 1896, the statisticians of the republic being more than a year-and-a-half behind those of the empire.

We have so recently given at considerable length the remarkably interesting figures of rates of fare and freight and of density of traffic on the Indian railroads that we shall not go into those matters now, but refer the reader to our issue of Jan. 8 last for such information, merely adding that the average passenger-mile rate was about one-third of a cent, and the lowest that we find (and that evidently not at all uncommon) was about 0.27 cent. This, be it understood, is taking the rupee at 26 cents.

Chicago & North Western.—The report of this company for the 38th fiscal year, being to May 31, is received. The miles worked remain the same, viz., 5,030.78. The results of working were as below:

Gross earnings:	1897.	1896.	Inc. or Dec.	
Passenger	$6,963,578	$7,408,827	D.	$445,249
Freight	22,236,612	24,354,622	D.	2,118,010
Express, mail, etc	1,777,053	1,725,312	I.	51,741
Totals	$30,977,243	$33,488,761	D.	$2,511,518
Expenses	18,877,089	20,373,402	D.	1,496,313
Taxes	1,061,732	1,075 569	D.	13,837
Interest	6,488,179	6,708,626	D.	220,447
Sinking funds	196,413	220,990	D.	24,578
From investments	336,790	257,909	I.	78,881
Net income	4,690,621	5,368,082	D.	677,461

The decline in passenger earnings was a trifle more than 6 per cent. and in freight earnings it was 10.87 per cent. In both cases this decrease is attributed to "the dullness and hesitation of business consequent upon the uncertainties of financial and political affairs which characterized the agitation of the Presidential election during the greater part of the fiscal year." The number of passengers carried fell off 9⅓ per cent., and the passenger-miles decreased 5⅔, the total passenger movement having amounted in the last year to 341,108,883 passengers one mile. The average rate also declined slightly,

namely, from 2.05 cents to 2.04. This decrease in rate amounted to $25,393 in the revenue of the company.

There was also a decrease in the freight rate, namely, from 1.03 to 0.99, or 3.88 per cent. This decrease alone made a difference of more than $903,000 in gross earnings. But the total freight movement fell off even in a greater ratio than the freight rate, namely, 4.99 per cent., the ton miles last year having been 2,254,027,285. The principal loss in tonnage was in iron ore and other ores, in which the decrease was 1,793,000 tons. In other freight there was a net loss of only 64,725 tons; that is, while lumber, wheat and flour, oats and barley, all fell off an increase in the tons of corn and rye of 237,000, pretty nearly made up for the smaller losses.

The company managed, however, to come through the year in good shape despite the diminished earnings. The total net income was nearly $4,700,000. Out of this more than a million and a half was paid in seven per cent. dividends on preferred stock and almost two millions in five per cent. dividends on common stock, the total dividend payments having been $3,518,650, leaving a surplus for the year of $1,171,971.

The greatest saving in operating expenses was in maintenance of equipment, namely, $1,072,000. In conducting transportation, however, there was a saving of $595,000. In maintenance of way and structures there was an actual increase of $129,000. The elaborate analyzed tables published in the annual reports of this company are not yet received, as we are dealing now with advance sheets of the general report. Therefore it is impossible to go into any analysis of expenses and savings. We find, however, that the cost per locomotive mile for wages, fuel and lubricants was reduced 10.21 per cent., to 16.01 cents per mile run. In the last year the engines made 25.86 miles to one ton of coal or cord of wood, being an increase of $\frac{3}{10}$ of a mile and 19.44 miles to one pint of oil, being an increase of 1.49 miles.

The net expenditure for the year for renewals and repairs of track and roadway amounted to $3,662,134. Nearly 30,000 tons of rails were laid and about 1⅛ million cross ties. Nearly half a million dollars was spent in repairs of bridges and culverts and, as we have said above, the charges for maintenance of way and structures actually increased over the preceding year. In maintenance of equipment there was a saving of over a million dollars and no additions were made to the numbers of locomotives or cars; but 429 engines were partly rebuilt in the company's shops and important improvements were made in car equipment by the substitution of new freight cars of increased capacity. These improvemonts were charged to operating expenses, as was the sum of $145,878 spent for the application of air-brakes and automatic couplers to freight cars. At the end of last May the company had 26,917 freight cars equipped with automatic couplers, or 76 per cent. of their stock, and with air-brakes 21,876 freight cars, or 62 per cent., were equipped.

The company had unusually heavy construction charges, which included building 36.46 miles of second main track on the Madison Division in Wisconsin, between the Wisconsin and Baraboo rivers. Great improvement was made in the alignment and grade of that portion of the road while this work was in hand. Six hundred and sixty-two thousand dollars was spent on this, and $105,000 was spent on second main track and changes in Iowa between Watkins and Luzerne. In the Chicago track elevation $530,000 was spent during the year and sidetracks to the amount of 31.76 miles, at a cost of $150,000, were laid on various divisions. In fact the total amount expended for construction amounted to more than 1¾ million dollars.

The sudden death of President Marcy, of the Fitchburg road, this week from a stroke of apoplexy, is connected by the daily newspapers with the recent investigation of the accounts of the road, which investigation is said to have been made at the request of one of the directors who suspected a defalcation; but so far as we can see there is little if any ground for any such conclusion. The amount of the alleged shortage is said to be $15,000, which, the reporters say, "will be a dead loss to the company," but losses of that degree of magnitude are familiar matters in railroad offices, and it does not seem reasonable to think that anxiety on this subject could have been the cause of a stroke of apoplexy. The whole story of the trouble in the accounts, from its first publication, several weeks ago, seems to be based largely on the statements of outside guessers. Much is made of the alleged wrongful handling of money by the lately deceased auditor, but auditors, as a general thing, do not handle money. How can such an officer steal the company's funds?

On Aug. 3 and 4, a special train over the Union Pacific, carrying officers of the company, was run through from Evanston, Wyo., to Omaha, 955 miles, without changing engines; and the time was 25 hours, or an average of 38.2 miles an hour. The last 291 miles (from North Platte) was made in 5 hours 35 minutes, equal to 52.1 miles an hour. Deducting a number of delays at meeting points and for taking water, etc., the net running time is given as 279 minutes, equal to 62.6 miles an hour. The locomotive was No. 890, a new one just turned out from the shops of the company and it was run through by the same crew all the way, Engineman Grogan and Fireman Griffin. In favorable places a speed of 78 miles an hour was made. The *Omaha Bee*, from which we take these figures, states that the best previous run by a single locomotive was 500 miles. We have no record of such a run, but one of 563 miles over the Wabash at 41 miles an hour was reported in July, 1886, and the Jarrett & Palmer train to San Francisco in 1876 was hauled from Ogden to Oakland over the Central Pacific, 876 miles, by one engine, No. 149. The record says that Engineman Hank Small took the train through and the rate of speed was given as 41⅛ miles an hour.

NEW PUBLICATIONS.

Proceedings of the Thirtieth Annual Convention of the American Railway Master Mechanics' Association. Chicago: J. W. Cloud, Secretary, The Rookery.

Mr. Cloud has brought out the 1897 Proceedings of the Master Mechanics' Association with great promptness and in fine shape. It is a volume of 336 pages, bound in half morocco. It is hardly necessary to say anything about its contents, as the papers and discussions have very recently been published at more or less length. It may, however, be convenient for the reader if we reprint here the subjects for the 1898 convention. These are: Tonnage Rating for Locomotives; Advantages of Improved Tools for Railroad Shops; Best Form of Fastenings for Locomotive Cylinders; Best Method of Boiler and Cylinder Insulation; Efficiency of High Steam Pressure for Locomotives; Square Bolt Heads and Nuts and Standards for Pipe Fittings; Air-Brake and Signal Instructions, and the Apprentice Boy. Besides these, a discussion of the subject of application of electricity to steam railroads was made a part of the programme for 1898 and the following questions which were not reached in 1897 are carried over to 1898: The special apprentice; is it possible to arrange front ends of locomotives so they will clear themselves of cinders without throwing sparks; the advisability of a systematic course of engineering in connection with technical schools, and the use of steel in locomotives.

The Official Railway List, 1897. A Directory of Presidents, Vice-Presidents, General Managers, etc., etc., and a Hand-Book of Useful Information for Railway Men. Sixteenth year. Chicago: The Railway List Co., 1897. Price, cloth, $2.00; flexible leather, $3.00.

This is the sixteenth annual edition of the "Official List," and, of course, the work is thoroughly well known to nearly all of our readers. The principal list is of railroad officers, the names of railroads being arranged alphabetically, and under the name of each railroad is some information as to the mileage, equipment, etc., of the road, and a list of officers, usually down to the grade of Roadmaster. This list is said to be carefully corrected to May 15th. Other lists are of the railroad associations, clubs and other organizations, of the national and state railroad commissioners, of traveling representatives of railroad supply-houses, of sleeping car and telegraph companies and of fast freight and private car lines. An appendix contains some useful rules and tables and engravings of M. C. B. standards and recommended practice. Finally, there is an alphabetical finding list of railroad officers.

TRADE CATALOGUES.

Hydraulic Tools, Cranes and Machinery.—Messrs. R. D. Wood & Co., Philadelphia, Pa., issue under date of August, 1897, a catalogue of 72 pages, showing hydraulic tools and machinery. Since 1893 the facilities of this firm have steadily increased and additions are constantly made to designs and patterns. Especial attention is called to light pneumatic riveters and cranes, using some combinations of hydraulic and electric or other power; also to the line of hydraulic valves. In addition to the regular lines, the firm makes a specialty of heavy work to the designs of purchasers. Besides this catalogue, pamphlets are issued descriptive of water and gas works appliances and the Taylor gas producer, with notes on gas fuel, all of which will be sent on application. Some machines of remarkable range and power are shown, as, for instance, an eye-beam shear and intensifier for cutting up to 30-in. beams. This is designed for working under 500 lbs. pressure per square inch, the intensifier augmenting the pressure in steps up to 3,000 lbs. This machine is fitted if desired with coping knives, by means of which the flanges are coped by the same stroke that cuts to length. A heavy hydraulic multiple punch or shear is shown working under 1,500 lbs. pressure. As a punch this will put 12 ⅞-in. holes at once through ⅝-in. steel plate. As a shear it will split 1¼ in. soft steel plate at 24 in. from the edge. Larger machines of this design are built to order. This machine exerts a maximum power of 180 tons. A number of designs of hydraulic riveters, fixed and portable, are shown. Fixed riveters are made up to 150 tons power and 17 ft. gap. The catalogue also shows a variety of hydraulic and electric cranes.

Machine Tools and Small Tools.—The Brown & Sharpe Manufacturing Co., of Providence, R. I., send us their 1897 catalogue and price list of machine tools and of small tools and gages. The announcement is made that with the beginning of 1897 the use of the firm name of Darling, Brown & Sharpe was discontinued and distinctions in orders and accounts are no longer necessary. The business once done by that copartnership is now carried on under the name of Brown & Sharpe. A special index is given to machine and small tools added since 1895 and to those replaced by new designs. The catalogue is a volume of 417 pages 3¾ × 5⅞ in., full of useful information. Of course it is unnecessary to into particulars as to the product of this celebrated house.

Lathes and Other Machines for Working Metals, Etc.—Messrs. Israel H. Johnson, Jr., & Co., 1,422 to 1,434 Callowhill street, Philadelphia, Pa., issue a catalogue dated January, 1898, showing a great variety of lathes and a considerable list of other machine tools and their parts. This is the sixth edition of their catalogue and does not purport to be a complete presentation of all the tools and machines built by this firm. The engravings are especially fine, being mostly line engravings, which give an accuracy of definition in small details quite impossible with half-tones.

Drop Forgings.—The Keystone Drop Forge Co., American and York streets, Philadelphia, Pa., successor to the Philadelphia Drop Forge Co., has issued a small catalogue and price list of drop forgings in iron, steel, copper and bronze. The pamphlet includes a description of the Keystone open link, drop forged from bar steel.

Nickel Steel for Boilers, Tires and Axles.

The few notes which follow are from a paper on "Nickel Steel as an Improved Material for Boiler Shell Plates, Forgings and Other Purposes," read before the Institution of Naval Architects by Mr. William Beardmore, Associate.

Nickel steel has by this time proved itself worthy of the confidence placed in it by those to whom its remarkable qualities are best known. Results obtained in the direction of procuring a material for shipbuilding and engineering purposes which will meet the ever-increasing demand for greater strength and lighter sections have been eminently satisfactory.

We require a metal which can be worked without any special care on the part of the artisan; a metal which in shipbuilding will enable us to reduce the scantlings, take from the weight of the boilers, add to the strength and reliableness of the propeller shafts; a metal which will give the same results to-day and to-morrow, in China or Peru. Nickel steel fulfills all these conditions, and is, in my opinion, a most suitable material with which to meet the demands for a metal stronger than steel.

The reason why nickel should give to steel its remarkable qualities, I shall not pretend to demonstrate, but would suggest that it may be due to the nearness with which the atomic volume of nickel approximates to that of iron. If we admit that the strength of steel is its elastic limit, it will not be difficult to make out a very good case for nickel steel, as it is here that this alloy shows its most striking characteristic. In nickel steel we have a metal whose elastic limit is equal to the ultimate strength of ordinary carbon steel. Mild nickel steel gives all the properties of high carbon metal without the treacherous brittleness so evident in the latter.

Nickel steel can be bent and punched quite as successfully as ordinary carbon steel. The bends of the softer qualities in no way differ from what we expect from ordinary carbon steels, but the results obtained on bending a steel of 51 tons tensile strength are somewhat remarkable. Regarding the welding qualities of this alloy much discussion has taken place, and many different opinions are held, but I have found no difficulty in welding nickel steel. The loss of strength due to punching in nickel steel of 50 to 55 tons tensile strength is 15.5 per cent., and in steels of higher tensile, 20 per cent. These figures will show the superiority of nickel steel under this treatment.

As a material for tires and axles nickel steel has many claims on our attention. Indeed, I am of the opinion that there is a wide field for its use in this direction, and were it adopted for this purpose there would be fewer accidents from failures in rolling stock. I would ask your attention to the tire now before you, which has been subjected to the compression test. The usual requirements are that tires stand compressing one-sixth of their diameter without cracking.

The original diameter of this nickel steel tire was 39½ in., and it was pressed down to 19 in. without showing signs of fracture.

A very striking feature of nickel steel is this, that a crack appearing in it will not develop, as in carbon steel. One of the most frequent causes of casualties at sea is the breaking of propeller shafts due to the development of some flaw in the shaft. In my opinion, if propeller shafts were made of nickel steel the question of failures would seldom or never be raised, from the reason that should a crack appear at all in nickel steel it will not develop as it would in ordinary carbon steel. This remark applies, of course, with equal force to railroad axles. I have formed this opinion by witnessing the results of the following experiments. Having had a number of bars made 1½ in. square by 18 long of nickel steel, and also of ordinary carbon steel of the same carbon content, I nicked these on one side with a cold chisel and proceeded to subject them to the usual fatigue test in this manner. The bars were placed on supports 10 in. apart, and a weight of 10 cwt. allowed to fall on them from a height of 3 ft., the bars being reversed after each blow. The test was continued in each till the bars showed signs of fracture, the number of blows at this stage noted, and the experiment continued till the bars broke. The treatment of the nickel and carbon steel bars was identical, but the results were widely different. The carbon steel was fractured after five blows and broken after 12 blows, while it required seven blows to fracture the nickel steel, and 35 blows to break it, an increase of 147 per cent. In the case of the carbon steel the fracture is crystalline, but in the nickel it is fibrous, and shows clearly the feature I wish to emphasize, viz., that nickel steel tears gradually, while carbon steel, once cracked, breaks short.

In a paper on "Steel for Forgings," read before the Engineers' Club of Philadelphia, by Mr. A. L. Colby, it is stated that the American government, which formerly specified for forgings, steel of 28 to 30 tons tensile strength, and an elastic limit of 14 tons, have increased their requirements to 36 tons; and the elastic limit to 22 tons, equal to 61 per cent. of the breaking strain. Mr. Colby points out that these higher requirements are met by using nickel steel.

In discussing the question of crankpins and the failures therein, Mr. Colby makes the following remarks: "When steel was first used in such pins in place of wrought iron, a soft low carbon steel was first employed, and the failures due to 'fatigue' of the metal were almost as numerous as when wrought iron was used. The broken pins showed what has been called a 'fracture in detail,' a gradual parting of the steel extending inward all around the piece, undoubtedly produced by the working strains repeatedly approaching the low elastic limit of the soft steel. On substituting a

steel with an elastic limit of 20 tons, failures were greatly diminished, and that without changing the shape or diameter of the pin.

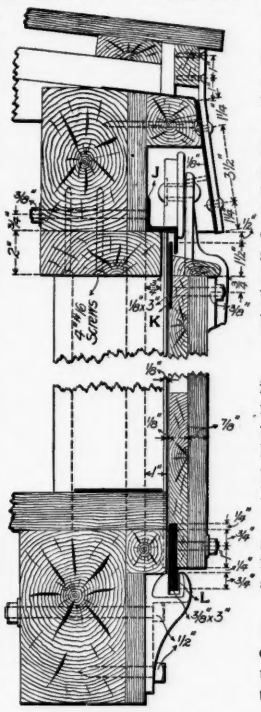
The point to which I wish to call attention is that Mr. Colby obtained his elastic limit of 20 tons by raising the carbon to 0.45 per cent. In the alloy we are at present discussing, the same or even higher yield point can be obtained by the use of nickel with .17 per cent. of carbon.

In speaking of the advantages of nickel steel Mr. Colby says: "Nickel increases the ratio between the elastic limit and tensile strength, and also adds to the ductility of the steel." What Mr. Colby calls "mild steel" has an elastic limit of 13 tons, or 46.4 per cent. of the breaking strain. The yield point of the medium hard steel is 16.7, or 46.2 per cent. breaking strain. When we come to the nickel steel, however, we find it has an elastic limit of 22.3 tons, or 58.7 per cent. of the breaking strain. Speaking generally, it may be said that the elastic limit of the nickel steel, which I recommended for forgings, is about the ultimate strength of ordinary mild steel, and Mr. Colby's figures are in the direction of corroborating this statement of my own experience. As a material for castings much can be said in favor of nickel steel. Tests cut from the cylinder for a 12,000-ton hydraulic press in course of erection at my works, and cast of nickel steel, gave, when annealed, an elastic limit of 25 tons per square inch, being 60 per cent. of the breaking strain. To give some idea of the size of this casting, I may state that it weighs 34 tons.

The Security Car Door.

The accompanying illustrations show the Security car door which is now being introduced by the National Railway Specialty Co., Old Colony Building, Chicago.

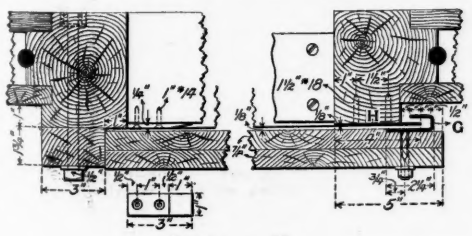
The important feature of its construction consists of a ⅛-in. metal locking strip, *G*, fastened to the back of the door, which engages a plain ⅛-in. steel strip, *H*, on the door post when the door is closed. As shown, by this means the rear edge of the door forms a lock extending the full height of the door and protects the contents of the car from the weather, cinders and sparks when the car is so placed in the train that the rear of the door is toward the engine. On account of the locking strip at the rear of the door the car cannot be entered without breaking the car seal.



Guide Block. Sections CD, and EF.

The door is suspended by two hangers carrying rollers which travel along a straight "Z"-shaped track *J*; the under side of the track is in contact with a plain ⅛-in. steel strip *K*, attached to the top of the door which answers the purpose of forming a joint similar to that at the rear, and also causes sufficient friction to prevent the door from shifting from one position to another when unlocked. Along the bottom of the door is bolted a ⅜-in. steel plate *L*, which fits loosely in the lower guide-blocks attached to the car. It will also be seen that when the door is locked and sealed, the hangers above and the guide blocks below can be removed and the door will still retain its position.

The claims made for this arrangement are that the door cannot swing out or unhang itself, it is easily applied to present designs of cars and requires no cleats, while having practically a steel frame.



Section on AB.

At the recent conventions at Old Point Comfort a full-sized Security door was exhibited, which attracted much attention.

TECHNICAL.

Manufacturing and Business.

The Philadelphia & Reading Railway has bought the property of the old Whitney Car Wheel Works on Pennsylvania avenue, Philadelphia, Pa., and will use the land for a freight yard.

The Schenectady Locomotive Works, of Schenectady, N. Y., are building a new riveting tower in their boiler shop, and will put in two new hydraulic riveters of 75 and 100 tons capacity each, one with a gap of 17 ft. and the other 12 ft. They are being built by R. D. Wood & Co., of Philadelphia. Both riveters will be supplied with 20 ton electric cranes, furnished by William Sellers & Co., Inc., of Philadelphia. But one man will be required to run each riveter and crane combined. He will stand on the platform of the riveter.

David B. Carse, well known to the railroad trade for over 10 years as General Manager of Greenlee Bros. & Co., Chicago, makers of woodworking machinery has resigned to become President of Carse Bros. Co. His brother, John B. Carse, manager of the machinery department of Thomas Kane & Co., Chicago, and who is now in England, will be associated with the new company. They will handle special railroad machinery, of which they have exclusive sale.

F. E. Kinsman and A. A. Knudson, members of the American Institute of Electrical Engineers and well known as inventors of electrical appliances, a number of which are in use, are now doing business as consulting electrical engineers under the firm name of Kinsman & Knudson, with offices in the Manhattan Life Building, 66 Broadway, New York. They have recently enlarged their scope of work to give special attention to railroad business.

The Structural Iron Co. has begun building a new shop 80 × 200 ft., for structural work, including bridges. A second building of about the same dimensions will be built when the first is finished, and will be furnished with compressed air and hydraulic machinery.

The Ensign Manufacturing Co., of Huntington, W. Va., has received an order from the Long Island Railroad for two No. 2 single-track Russell snowplows, one with and one without hand flanger, and one No. 2 double-track Russell plow with hand flanger. These are to be delivered by Nov. 15.

The air compressor department of the Ingersoll-Sergeant Drill Co., at Odenweldertown, near Easton, Pa., is running night and day. The other departments are all working full time.

The Louisville, Evansville & St. Louis Consolidated has decided to equip its freight cars with automatic couplers and air-brakes, and the court has authorized the Receiver to issue $100,000 Receiver's certificates for that purpose. The work will not all be done this year.

The Simplex Railway Appliance Co. has been incorporated in Illinois, with a capital stock of $75,000, by Frank H. Drury, William O. Belt and Otto R. Barnett.

The Brooks Locomotive Works, at Dunkirk, N. Y., is building a new paint shop. It will be 118 ft. long and 120 ft. wide and fireproof. It will have seven standard gage tracks running through the building and one narrow gage track, and a transfer table running near the center of the building 22 ft. wide and 89 ft. long. The building will accommodate 12 standard tenders, 10 standard cabs and 12 standard pilots. The work is being done by the Shiffler Bridge Co., of Pittsburgh, Pa.

The Chicago Locomotive Appliance Co. was incorporated in Illinois last week. The incorporators are: George N. Morgan, Frank J. Baker and Edward A. Field.

The plant of the Lackawanna Lubricating Co. at Scranton, Pa., has been sold to a syndicate composed of Messrs. Simpson & Watkins, Everett Warren and Charles E. Wade. The company made brass goods, including oil cups for engines.

The works of the New York Air-Brake Co. at Watertown, N. Y., which have been running four days a week for some time, are now running six days. Three hundred men are at work.

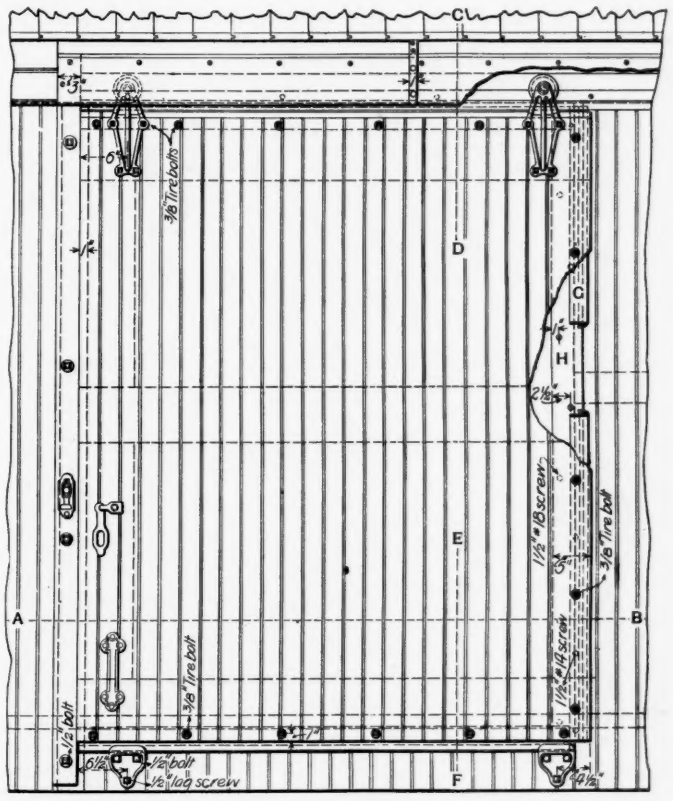
The Parrish Signal Co., of Jackson, Mich., was formed Aug. 4 to make a street and steam railroad crossing signal patented by Homer A. Parrish, of Jackson. The officers and directors are: President, E. S. Hobbs; Vice-President, C. C. Bloomfield; Secretary, L. B. Trumbull; Treasurer, E. D. Warner. Directors: E. S. Hobbs, C. C. Bloomfield, E. D. Warner, L. B. Trumbull, E. R. Warner, Homer A. Parrish, F. M. Kendall. The capital stock is $100,000.

The Bidwell Metallic Tie Co. has been organized under the laws of Kansas, with a capital stock of $150,000. The officers are: President, A. Bidwell; Secretary, A. H. Bandy and Treasurer, F. Bever. The Directors are: A. Bidwell, A. H. Bandy, Frank Bever, B. F. Meeks and J. A. Lentz. The office of the company will be at Eldorado, Kan.

Iron and Steel.

Judgments for $320,934 25 have been filed against the plant of the Wellman Steel Co., at Media, Pa., in the interests of first and second mortgage bondholders. The plant will probably be sold under foreclosure about the third week in October.

The Lackawanna Iron & Steel Co., of Scranton, Pa., has placed an order with the Cornwall (Pa.) Ore Banks Co. for 600 tons of ore daily.



The Security Car Door.

The Sable Iron Works, of Zug & Co., Pittsburgh, resumed work in the puddling and bar mill departments last week.

The Totten & Hogg Iron & Steel Foundry Co., of Pittsburgh, has been awarded the contract for the machinery for the new four-mill tin-plate plant to be built by the La Belle Iron Works in Wheeling, W. Va.

The Whittaker Iron Co., of Wheeling, W. Va., is preparing to convert two of its sheet furnaces into tin mills.

Arrangements have been finished for reopening the Westerman rolling mill at Marion, Ind., which has been idle for about a year. The mill will produce bar iron.

The Excelsior furnaces at Ishpeming, Mich., were put in blast last week, after an idleness of eight months. The furnaces produce charcoal iron.

The pipe department of the Delaware Iron Works at New Castle resumed work Aug. 6. Three welding and two bending furnaces are ready for blast.

The Birmingham (Ala.) Rolling Mill resumed work in all departments at midnight of Aug. 8, giving employment to 1,500 men who have been idle since July 1.

The Tennessee Coal & Iron & Railroad Co. blew in another furnace at Oxmoor Aug. 8, making 15 furnaces now in blast.

The strike of the employees of the Anderson & Du Puy Steel Co.'s mills at McKees Rocks, Pa., caused by the announcement of a reduction of 15 per cent. in wages, has been settled, the company making the reduction six per cent. Work was resumed last week.

The Alabama Rolling Mill, at Birmingham, has given notice that it will resume work Aug. 16.

The Newark (O.) Weldless Tube & Steel Co. has given an order to George W. Knopf, Carnegie Building, Pittsburgh, for a new rolling mill plant. It will be 90 × 160 ft. and built entirely of steel with slate roof.

The Central Iron & Steel Co. of Brazil, Ind., is building a new spike mill 65 × 100 ft. and making repairs in other departments.

At the annual meeting of the Lackawanna Iron & Coal Co. at Scranton, Pa., Aug. 4, the following Directors were elected: Edward F. Hatfield, President; Samuel Sloan, William E. Dodge, Henry A. C. Taylor, De Witt C. Blair, Moses Taylor Pyne, S. S. Palmer, Walter Scranton, of New York, and William F. Halstead, of Scranton. Mr. Halstead was elected to fill the vacancy caused by the death of James Blair.

The Chester (Pa.) Pipe & Tube Works started on double time last week. The company has leased the plant of the Tidewater Steel Works at Chester, which has been idle for several years and will furnish it with new machinery for rolling skelp for use in the pipe mills.

The equipment for the new tin mill of Hamilton & Co.

at West Newton, Pa., referred to in our last issue, has nearly all been ordered. The steam plant, consisting of a 36×60 in. Allis engine and two 18×72 in. tubular boilers, will be furnished by Wm. B. Pollock & Co., of Youngstown, O. The Frank-Kneeland Machine Co., of Pittsburgh, is building the mill machinery, and the Dunbar Fire Brick Co., of Dunbar, Pa., will furnish the necessary fire-brick. A Mesta patent picking machine made by the Leechburg Foundry & Machine Co. will be used. E. E. Erikson, Conestoga Building, Pittsburgh, has the contract for building the foundations, superstructure and furnaces.

The sale of the plant of the Pottsville Iron & Steel Co., referred to in our issue of July 16, has been set for Aug. 25, at Pottsville, Pa.

The sheet and rolling mills of the Reading Iron Co., resumed work on full time last week, after an idleness of seven weeks, caused by the refusal of the employees to accept a reduction in wages. The company is building a new engine-house at its Keystone furnaces, at Reading, and the machinery used at the dismantled Bechtelsville & Ringgold furnaces will be used to increase the capacity of the blowing engines at the new furnaces.

The property of the Brilliant Tube and Iron Works, at Brilriant, O., over which there has been much litigation for a year between Assignee and Receiver, was sold at Steubenville Aug. 9 by H. M. Priest, Receiver, to the Wheeling Title & Trust Co., as Trustees for the first mortgage bondholders, for $35,000, two-thirds the appraised value. The property includes the rolling mill property and 460 acres of coal lands.

New Stations and Shops.

The foundations and approaches for the new station of the Lehigh Valley Railroad at Court street, Rochester, N. Y., have been finished. The contracts for the superstructure have not yet been awarded.

J. H. Archer & Son, of Dallas, Tex., have been awarded the contract for the new Union station of the St. Louis Southwestern, of Texas, and Houston & Texas Central railroads, at Corsicana. According to the terms of the contract the station must be finished by Dec. 1. The building will be of red pressed brick and red Pecos sand stone.

The repair shops of the Louisiana Southern on the outskirts of New Orleans, La., have been finished. The shops are equipped to repair machinery and it is expected that considerable of this work will be done for people along the line of the road.

Plans have been prepared for a new station for the Maine Central road at Brunswick, Me. The building will be 149 ft. long, 30 ft. wide and two stories high, and cost about $35,000. Red brick and granite trimmings will be used.

Bids from a large number of contractors have been received by the Illinois Central Railroad for a new passenger station at Springfield, Ill. The cost of the station will be, approximately, $80,000.

The Erie Railroad has given a contract for a new passenger station at Franklin, Pa., to May & Osborn, of Franklin, who have already begun work. The main building will be 49 × 38 ft., one story high, and contain a general waiting-room a ladies' waiting-room and ticket office. The baggage room, which will be attached to the main building, will be 34 × 23 ft. The building will be of brick, with stone trimmings, and a tile roof. All interior woodwork will be Georgia pine.

Interlocking.

The Standard Railroad Signal Co., of Arlington, N. J., has contracted to put up for the Erie road a switch and signal plant of 20 levers at Little Falls, N. J., one of 16 levers at Pompton Plains and one of 16 at Wayne.

Tie Plates.

The Q & C Company has issued the following circular: "We desire to give notice that the exclusive manufacture and sale of the tie plate known as the C. A. C. plate, which is now made in its improved form, is now in our hands, and all quotations and inquiries should be addressed to us. . . . Our company is recognized as having introduced into successful use the plate well known as the Servis tie plate. We have been strong advocates of the longitudinal form of plate with flanges on the outer edge of plate, and the 12 years' success of same, and the many millions in use, distributed over most of our large railroad lines, are facts which prove the justification of our claims. . . . While we cannot consistently advocate forms of plates which differ from the Servis, still to those who insist upon making personal trial, or who specifically demand plates having upper shoulders and crosscutting flanges on under surface of same, we offer the C. A. C. plate, as now improved, as being the most perfect and effective form of that kind."

Delaware Avenue Front Improvements in Philadelphia.

Plans and specifications were exhibited Aug. 4 by the Bureau of Surveys of Philadelphia for a new bulkhead on Delaware avenue from Vine street to South street inclusive. The bids will be opened Aug. 19, the work to be completed within 18 months from date of notice given by the Director of Public Works. The total amount of money available for the improvement is $2,162,000, of which $1,500,000 was appropriated by councils and $650,000 comes from a fund established by the will of Stephen Girard, a considerable portion of the frontage in question being under the control of the Girard Trust. The work will comprise the widening of Delaware avenue from its present width of 50 ft. to one averaging 150 ft. The contractors are to furnish the material for the filling, are to construct a bulkhead wall of concrete masonry on the easterly side of the avenue, and to rebuild all the sewer outlets of this portion of the city. Where the bulkhead faces a dock or water way, the soft mud immediately under it will be dredged away, the concrete wall will be carried down to the level of the bottom of the river, and will rest on a foundation of piles, protected by hard gravel and riprap. When the bulkhead wall is hidden behind piers and ferry-slips, the concrete will rest on a platform supported by piles whose heads are sawed off at the level of mean low water.

To the port of Philadelphia the work is most important, and is the partial consummation of improvements carried on in conjunction with the United States government, and commenced nearly 10 years ago. These have involved the removal of the islands and bars in front of the city, containing 21,000,000 cubic yards, a work costing about $3,000,000; the dredging, now almost completed, of a channel to the sea 26 ft. deep and 600 ft. wide; the widening of the Delaware avenue front just described, and finally the extension of the piers to a new Port Warden's line, giving them an average length of 550 ft. These, it is anticipated, will enable Philadelphia to meet all the requirements of sea-going vessels of the largest size, and place her once more in the front rank of great commercial cities.

New York State Canal Work.

Superintendent George W. Aldridge, of the State Department of Public Works, awarded contracts Aug. 9 aggregating $1,372,009 for work to be done on the middle division of the Erie Canal under the $9,000,000 appropriation fund, as follows: For improving the canal from a point 100 ft. west of Greenfield's road bridge to a point 100 ft. west of Main street road bridge, at New London, 8.45 miles, to the Warren-Scharf Asphalt Paving Co., of New York City, for $242,758; from the last-named point to a point 100 ft. west of Durhamville road bridge No. 63, 8.31 miles, to the Warren-Scharf Asphalt Paving Co. for $212,945; from the last-named point to a point 100 ft. west of New Boston road bridge, 9.04 miles, to the National Contracting Co., of New York City, for $232,307; from a point 100 ft. west of Kirkville road bridge to a point 100 ft. east of Butternut Creek aqueduct, 5.86 miles, to the National Contracting Co. for $136,720; from the last-named point to a point 100 ft. east of the Upper Hollow Quoin of lock No. 49, 5.3 miles, to the National Contracting Co. for $127,750; from a point 100 ft. west of the Lower Hollow Quoin of lock No. 51 to a point 100 ft. west of Centerport road bridge, 5.56 miles, to John Dunfee & Co., of Syracuse, for $136,600; from the last-named point to a point 100 ft. west of Crane Creek aqueduct, 5.03 miles, to Willoughby P. Priddy, of Spring Lake, N. Y., for $115,713; from the last-named point to the east line of Wayne County, 6.24 miles, to Andrew Onderdonk, of New York City, for $167,216. Superintendent Aldridge has advertised for bids for improving 69.76 miles of the Eastern Division and 7.2 miles of the Middle Division of the Erie Canal, said bids to be received at his office, in Albany, N. Y., until noon of Aug. 24 next. He has also advertised for bids for improving 67.34 miles of the Western Division of the Erie Canal, bids to be received at his office in Albany until noon of Sept 3 next. Plans and specifications are now on view at Albany, also as the office of Thomas Wheeler, Assistant Superintendent of Public Works, in Syracuse, N. Y., and at the office of R. G. Lay, Assistant Superintendent of Public Works, in Rochester, N. Y.

Dredging the Hudson River.

The Dock Commissioners of New York City have awarded a contract to P. Sanford Ross, of Jersey City, N. J., to dredge 200,000 cu. yds. in the Hudson River north of Thirty-fourth street, at 17¾ cents a yard.

Armor Plate for the Government.

Owing to the refusal of the Carnegie and Illinois Steel companies to furnish armor plate for battleships at $300 a ton and the belief that other companies would not accept, the special Board authorized by the last Congress to investigate the cost of establishing a government armor plant, met in Washington, Aug. 9 to organize. The Board consists of Commodore Howell, Commandant of the League Island Navy Yard; Captain McCormick, Captain of the Norfolk Navy Yard; Chief Engineer Perry, from the Monterey; Civil Engineer Menocal, from the New York Navy Yard; Lieutenant Fletcher, from the Torpedo Station, with Lieutenant W. I. Chambers, from the Minneapolis, as Recorder. According to reports, offers to sell or lease their plants to the government have already been received from a number of makers of steel. Mr. Roosevelt has announced that the offer of the Wm. Cramp & Sons Ship & Engine Building Co., of Philadelphia, to supply diagonal armor for the battleship Alabama at $300 a ton has been accepted.

THE SCRAP HEAP.

Notes.

The Customs Collector at Chicago on Aug. 4 collected the duty—20 per cent.—on the first importation of railroad ties under the new tariff law.

The Northwestern elevator at Grand avenue, Chicago, was destroyed by an explosion on Aug. 5 and three firemen were killed. A dozen other persons, including bystanders, were injured, some of them fatally. Much damage was done by a fire which followed the explosion. The grain stored in the elevator was estimated to be worth $100,000, while the building was valued at $150,000. The building and contents were insured for about one-half these amounts.

E. F. Moore, Mechanical Engineer for the Railroad Commissioner of Michigan, has examined all of the drawbridges and crossings on the electric railroads of the state and has made to the Commissioner a report on the subject of safety appliances. It appears that there are 10 drawbridges in the state crossed by electric railroads, some of them being crossed by cars or trains over 400 times a day. There are 13 places where electric lines cross standard (steam) railroads. Mr. Moore recommends the fixing of suitable interlocked signals at all drawbridges and at the crossings described. He also recommends that the method of construction of the safety devices be subjected by law to the approval of the Railroad Commissioner.

Railroad Taxes in Missouri.

The State Auditor of Missouri has made his report of the work of the State Board of Equalization in connection with the railroad tax assessments for 1897. The length of railroad in the state is 6,593 miles, an increase of 79 miles over 1896. The aggregate valuation of railroads and bridges, and telegraph and private car line property, is $79,430,966, an increase of $3,399,047 over the valuation of the previous year. The valuation of a number of roads is increased $500 or $1,000 a mile, and in a few cases the increase was much larger; on the Terminal Railroad of St Louis, $100,000; St. Louis Transfer Railway, $10,000; Wiggins Ferry Co.'s tracks, $10,000; Kansas City, Pittsburgh & Gulf, $2,500. The valuation of the Union Station in St. Louis was increased $255,000. The valuation of telegraph lines was increased 50 per cent.

Horseless Carriages in France.

The *Engineer* (London) has recently sought accurate data of the motor carriage industry in France, but has met with little success. It has been impossible to get definite answers to a large part of its inquiries, for the reason that most of the work appears to be only in an experimental state. There are, however, about 40 builders in France who profess to make self-propelled carriages. If all of these makers could produce thoroughly serviceable machines in sufficient number to supply the demand, the industry would seem to be on a broad basis. But serious doubt is entertained as to the efficiency of the motors and the ability of the makers to turn out carriages in any number. There are only two motors that have been put to the test of long public service. Of these, the improved Daimler takes the lead. The carriages equipped with these motors run satisfactorily on smooth and level roads; still they have the drawbacks of smell, vibration and noise. The other motor is the Benz, and a few of these are running in France. It was said a while ago that when the Anglo-French Co., which makes the latter motor as improved by Roger, was formed a large works would be built to make motor carriages on a considerable scale. Motor cabs were also to be run in Lyons and elsewhere. The promised works and the subsidiary companies that were to run the carriages, however, have not made their appearance. There are several new motor carriages which will probably give satisfactory results. Among these may be mentioned the Mors and the Amédée Bollée, but these have not yet been delivered in any number. Electricity and steam have both been tried as motive powers, but the petroleum motors still have the preference.

Brevity.

The latest story in railroad circles is about Mr. Flannigin, a section boss. His superior was Mr. Lannigin to whom Mr. Flannigin made his reports. These reports he was in the habit of writing out at great and unnecessary length until he was finally advised by his boss to use more brevity in making them out. Some time after there was a small freight wreck on Flannigin's section, in which one or two cars were ditched. The wreck was cleared up, and when the chief section boss received the report it read as follows:

"Mr. Lannigin: Off agin; on agin; away agin. Flan igin."

Crudities of Railroad Taxation.

Mr. Ingalls, President of the Cleveland, Cincinnati Chicago & St. Louis, who has a habit of using plain and emphatic language in his public utterances, recently appeared before the Indiana State Board of Equalization to ask for a reduction of the road's tax assessment; and in the course of his argument said: "This is an era of wild expenditures in state, national and municipal governments," he asserted, "and taxes on railroads, and on everybody else, for that matter, are too high. Last year the Big Four paid out six per cent. of its gross and 18 per cent. of its earnings to the state of Indiana for taxes. It was worsted in 1891, when the new State tax law went into effect, being punished at that time because it had good credit." He said that the road paid its last dividend on common stock in 1893. In 1891 the preferred stock sold for 105; now it is 66. Altogether there had been a shrinkage in values on stock of 42 per cent. The road was now assessed in Indiana on a basis of $16,222,000, when it should not be, according to this shrinkage, in excess of $10,000,000. The road's equipment had been allowed to decline because the company could not afford to renew it, but, although there are now 17 less locomotives than in 1891, the board had continued the appraisement at the old figures. The Greensburg & Columbus was assessed at $7,500, but Mr. Ingalls offered to sell it to the board for $7,000. The Fairland-Martinsville branch was assessed at $5,000 per mile, and he offered this to the board for less than $75,000, there being 28 miles of it. Mr. Ingalls also claimed that the Peoria division to-day was taxed 110 per cent. of its value in Wall street.

Railroad Matters in South Australia.

The Railway Commissioner of South Australia has made a report on the proposal to connect South Australia with Western Australia by railroad. It is estimated that the cost for 553 miles will be £1,903,000, of which provision of water is £292,000; and rolling stock £80,000. The suggested expenditure for the provision of water is large, but the country traversed has no natural water holes, or at least none which could be used for railroad purposes, and it is therefore recommended that a reservoir should be constructed about every 25 miles along the whole distance. The estimated provision for rolling-stock comprises 17 engines, 12 coaching vehicles, 4 goods brakes and 120 goods and live stock vehicles. If the Western Australia government would continue the line

from the border to connect with their system, the receipts would probably amount to £85,000 per annum, and the existing lines would benefit from the increased traffic to the extent of £27,000 per annum. With a through line to the goldfields there is reason to think that a large passenger traffic and traffic in merchandise and live stock would result. As regards the working expenses the estimated revenue could be earned by the running of four trains each way a week, and on that basis we could put the annual expenditure at £50,000. The excess of the earnings over the working expenses on the new line represents 1.84 per cent. on the capital cost, or, if the net additional traffic on the old line be included, the revenue would be £53,000, representing 2.79 per cent. on the capital cost. The interest of the loan of £2,000,000 at three per cent. would, however, be £60,000, so that the general revenue would be taxed to the extent of £7,000 by the construction of this line.

[At the end of 1895 South Australia had 1,888 miles of railroad open for traffic, and Western Australia had 1,164 miles open and 115 miles under construction.]

Bolivian Oriental Railway Company.

The Bolivian government has recently granted to Mr. Swan, an American citizen, a concession for a railroad to run from a point in Bolivia, on the west bank of the Paraguay River, northwest to Santa Cruz de la Sierra, capital of the department of that name. Branches of the road will run in the direction of Beni, Acre and Madre de Dios The concessionary syndicate is the American Development Co., and a construction company is to be organized under the name of the Bolivian Oriental Railway Co. The Bolivian government will guarantee 6 per cent interest for 20 years with mortgage on the customs revenues, present and future, of the regions bordering upon Paraguay and the department of Beni. It will also give 8,000 square leagues of vacant lands and exemption of all import duties on necessary materials. By the terms of the concession the syndicate must deposit a guarantee of 50,000 bolivianos within one year from Feb. 1, 1898

The Space Interval on the Atchison.

The Atchison, Topeka & Santa Fe is putting up block signals between Emporia, Kan., and Newton, on the main line, 73 miles, and between Holliday and Emporia Junction, on the Emporia branch, 100 miles. Apparatus and electrical connections will be used similar to those on the Chicago, Milwaukee & St. Paul. Several new telegraph offices will have to be established. The Atchison has automatic electric block signals between Kansas City and Holliday, 14 miles.

Underground Electric Railroad for Berlin.

A new project has been brought forward for an underground electric railroad in Berlin. The object is to unite the northern and southern parts of the city. The overhead Siemens & Halske line now building will join the eastern and western quarters. It is expected that trains will be run on a headway of three minutes at a speed of from 20 to 30 km. an hour and each train will carry 160 passengers. The cost is estimated at 13,000,000 francs.

Machinery Exposition in Peru.

The Peruvian government, wishing to increase trade in the machinery and kindred lines with manufacturing countries, has decided to establish a permanent exposition of all classes of manufactured articles in the lines of machinery, giving preference to such as are mostly used in Peru, viz., agricultural implements, mining machinery, electrical appliances of every description and apparatus for labor-saving machinery. The Peruvian government has never before given such inducements to foster trade, and the facilities offered to American manufacturers are advantageous. All exhibits will be exempt from custom house duties as well as from consular fees The exposition will be inaugurated in Dec. 9 next, at Lima, Peru. Exhibitors will have the option to show their wares for a period of six months. Should longer time be required, arrangemenss may be made by applying to the officials in charge. Further particulars and copy of the rules and regulations with application blank will be furnished by Carlos G. Estenos, Acting Consul-General, 19 Whitehall street, New York City.

Lake Notes.

The usual weekly record-breakage is to be credited this week to the schooner Amazon, which loaded at Duluth 6,276 net tons of iron ore.

Coal stocks at head of Lake Superior are being drawn on to supply railroads at Chicago and vessels in the Lake Erie trade. In consequence these stocks are about 200,000 tons less than usual for this season.

It is understood that from three to four million bushels of wheat have been sold at Duluth for September shipment, for export, and that freight room has been contracted for it at 2 to 2¼ cents a bushel to Buffalo.

The only important recent addition to the lake marine, and about the only large vessel to be launched this year, was put afloat at the Union docks at Buffalo last week, the steel ship Starucca, a package freight vessel for the Union line. The boat is fitted with all the latest improvements and conveniences for handling package freight.

The Lebanon Springs Railroad.

If this road is abandoned, as it is now threatened, it will close a somewhat interesting chapter of history. The road was built by Trenor W. Park. Mr. Park having acquired a fortune in California, returned in 1864 to Bennington, the home of his boyhood and early manhood. He built at North Bennington the spacious residence now the summer home of his son-in-law, Gen. J. G. McCullough. He established the First National Bank of Bennington and bought the Western Vermont Railroad, now known as the Bennington & Rutland. His next project was to connect this with the Harlem road, by the construction of a railroad 60 miles from Bennington, by way of Lebanon Springs to Chatham, N. Y., the northern terminus of the Harlem Railroad. This built, as he reasoned, would become part of a great through line from Montreal to New York, and would add greatly to the value of his railroad property, including the Central Vermont.

Mr. Park set about the enterprise with characteristic energy. He could not wait for the regular session of the legislature in order to secure a charter, but induced Governor Page to call a special session, which opened at Montpelier, March 27, 1867, and adjourned two days later, during which time the Lebanon Springs road was chartered. It did not prove to be an easy or cheap road to build. Mr. Park sank in it almost the whole of his whole fortune—he made another fortune later—and some of the money of other people, and when it was built it became a source only of disappointment and disaster to him and to all its owners. Mr. Park called it the Harlem Extension, but it was never for a day any real extension of the New York & Harlem road. Commodore Vanderbilt, who owned the Harlem and controlled the Hudson River road and was about to unite these with the New York Central, had plans and interests which did not coincide with Mr. Park's. The old Commodore never permitted a single through train to run between New York and Montreal by way of the New York & Harlem and the Harlem Extension.

Upon the failure to secure a through connection with the Harlem road followed the inevitable failure of the Lebanon Springs road as a business enterprise. Its local business has not been sufficient to pay its running expenses and keep it in repair. Every effort to put it upon its feet has failed; the condition of its track has finally become such that it is no longer safe to run trains over it and traffic has ceased.

Whether any fresh attempt to resuscitate it will be made, or can succeed if attempted, is a matter of grave doubt. The short portion from Chatham to Lebanon Springs (19 miles) may be maintained, but it will not be surprising if the rails are taken up from the rest of the line and the grass allowed to grow on the roadbed.—*Free Press, Burlington, Vt.*

Lehigh University.

We are informed, from sources that leave no possible doubt, that the reports which have appeared about Lehigh University closing its doors are without foundation. It is true that the partial failure of the ordinary revenues of the university for the past four years has given the trustees much anxious thought, but there was no authorization for the statement that the college exercises would be suspended unless state aid were granted to the institution. Fortunately, the present emergency has been provided for by the grant from the state. The amount appropriated is $150,000.

Bridge Disaster in Russia.

A press dispatch of Aug. 5 reports that at Kertch, in the Crimea, a bridge on which were a large number of people collapsed, having been weakened by a flood, and that 38 persons were drowned.

Freight Traffic for July, 1897, through the United States and Canadian Canals at Sault Ste. Marie.

Eastbound.

Items.	Designation.	U. S. Canal.	Canadian Canal.	Total.
Copper	Net tons	19,327	1,107	20,434
Grain	Bushels	2,285,580	561,100	2 846,680
Flour	Barrels	814 815	222,858	1 037,673
Iron ore	Net tons	996,811	954,995	1,951.806
Lumber	M. ft. B. M.	120,567	209	120,776
Silver ore	Net tons	5	...	5
Wheat	Bushels	2,034,445	1,996,789	4,031,234
Unclass'd freight	Net tons	41,374	8,686	50,060

Westbound.

Items.	Designation.	U. S. Canal.	Canadian Canal.	Total.
Coal (hard)	Net tons	45,857	18,441	64,298
Coal (soft)	Net tons	142,991	53 484	196,475
Manufactured iron	Net tons	1[illegible],674	5.933	16,637
Salt	Barrels	26,264	4,5[illegible]0	30,764
Unclass'd freight	Net tons	39,249	20,094	59,343

Eastbound freight, net tons		2,515,232
Westbound freight, net tons		341,535
Total freight, net tons		2,856,767
Total craft—United States	1,958	
Total craft—Canadian	963	2,921
Total registered tonnage—United States	2,031,632	
Total registered tonnage—Canadian	815,974	2 847,606

LOCOMOTIVE BUILDING.

H. K. Porter & Co., of Pittsburgh, Pa., is building an engine for the Oregon Improvement Co.

We are informed that the Imperial Railways of Japan will probably order 130 or more locomotives before the work of double tracking the roads is finished.

CAR BUILDING.

The St. Charles Car Co. is finishing 32 freight cars for the Interoceanic Railway of Mexico.

The St. Charles Car Co., of St. Charles, Mo., is building 15 freight cars for the Kaslo & Slocan Railway.

The Burlington, Cedar Rapids & Northern has placed an order with the Wells & French Co., Chicago, for 200 box cars.

The Michigan Peninsular Car Co., of Detroit, Mich., has received an order to build 50 refrigerator cars for Swift & Co.

The Ohio Falls Car Mfg. Co., of Jeffersonville, Ind., is building 20 freight cars for the Rio Grande, Sierra Madre & Pacific.

The report published by a contemporary that the Peavey Grain Line Co. intends building new cars is denied by the company.

The President of the Kansas City, Fort Scott & Memphis denies the report that the company intends to order additional equipment.

The Ensign Mfg. Co., of Huntington, W. Va., has received an order to build 55 refrigerator cars for the Southern Pacific, for delivery in September.

The Kansas City, Pittsburgh & Gulf has placed an order with Barney & Smith Car Mfg. Co. for 250 box cars. Security car doors will be used. The road has also placed an order with the Pullman Palace Car Co. for 200 box and 100 flat cars, all of 60,000 lbs. capacity. They will be equipped with Tower couplers and Westinghouse brakes.

The Barney & Smith Car Co., of Dayton, O., has finished building 10 cars for the Scranton (Pa.) Railway. They are 28 ft. over sills, 38 ft. over all, mounted on Barney & Smith trucks, and equipped with four No. 3, 30-H. P. Westinghouse motors and "K-12" controllers.

The Worcester & Marlborough Street Railway has placed an order with the Newburyport Car Co., of Newburyport, Mass., for 10 closed cars. They will have 22 ft. bodies and vestibules, and will be equipped with G. E. 1,000 motors made by the General Electric Co. The some company has also built 12 open cars for the road.

BRIDGE BUILDING.

Albany, N. Y.—The Board of Contract and Apportionment let contracts Aug. 6 for the viaduct on the line of Knox street between Central avenue and Canal street, as follows: For the superstructure, to the Hilton Bridge Co., $14,700; the masonry work, to Whelan & Higgins, of Whitehall, $11,110; paving the viaduct and approaches, to T. Henry Dumary, $6,635.90. Work is to be begun not later than Aug. 24.

Boston, Mass.—Bids were received July 30 from 20 different contractors for building the Longwood avenue bridge in Brookline. The bids ranged from $115,000 to $171,769, the lowest being from Woodbury & Leighton, of Boston.

Chester, Pa.—The County Commissioners have given the contract to R. J. Robinson for rebuilding the bridge over Naylor's Run for $990.50.

Franklindale, Pa.—The Bradford County Commissioners have given the contract for a bridge to be 160 ft. long, over Towando Creek, to the Nelson & Buchanan Company, Chambersburg, Pa.

Iowa Falls, Ia.—The contract for the new steel bridge to be built over the Iowa River at this place has been let to the King Bridge Co., of Des Moines, Ia., for $4,700.

Lindsay, Ont.—T. Matchett, County Clerk of Victoria, has advertised bids for a bridge and approaches at Pigeon Creek, on the township boundary of Ops and Manvers. Plans and specifications are on view at the Court-House in Lindsay.

Louisiana, Mo.—The Chicago & Alton has made a contract with the Lassig Bridge and Iron Works, of Chicago, for a new through truss bridge over the Mississippi River at this place, to replace a bridge built in 1873. The new bridge will be single-track, of nine spans, designed for a load of two locomotives and tenders weighing 123 tons each, followed by a rolling load of 4,000 lbs. per lineal foot. Five spans will be each 158 ft. long, three other spans will be respectively 257 ft., 226 ft. and 316 ft. long, while the draw span will be 440 ft. The foundations will be masonry resting on piles.

Montreal, Que.—The contract for a bridge over the St. Lawrence, at a point near Cornwall, Ont., for the Ottawa & New York Railroad, has been given to the Phœnix Bridge Co., of Phœnixville, Pa. The bridge will have one cantilever span 850 ft. long, one draw span 277 ft. long, four fixed spans each 279 ft. long, two girder spans each 60 ft. long and 450 ft. of trestle.

This railroad company has also given contracts to the Phœnix Bridge Co., Phœnixville, Pa., for the following bridges: Over the Castor River, Ont., one fixed span, 116 ft. long; La Petite Nation River, Ont., one fixed span, 150 ft. long; Black River, New York state, one fixed span, 50 ft. long; St. Regis River, New York, two fixed spans, each 150 ft. long; Raquette River, New York, three fixed spans, each 150 ft. long, and two fixed spans, each 55 ft. long.

Mount Morris, N. Y.—Highway Commissioners Carr and Wilson have given the contract for the bridge across the Genesee River between this place and Leicester to the Owego Bridge Co., whose bid was $24,500.

New Bedford, Mass.—Bids ranging from $98,000 to $121,500 were received Aug. 2 for the superstructure of the middle part of the New Bedford and Fair Haven bridge. The Pennsylvania Steel Co., Steelton, Pa., was the lowest bidder.

Reading, Pa.—The contract for the stonework of the Schultzville bridge has been given to Wm. M. Kase and Peter M. Frank for $719.75.

Robinson's Ferry, Cal.—The Tuolumne County Supervisors have ordered plans and specifications made for a steel bridge over the Stanislaus River at this place; also for a steel bridge over the Tuolumne River, at Ward's Ferry.

Pittsburgh, Pa.—The Consolidated Traction Co. has let contracts for the Penn avenue, Shady avenue and Highland avenue bridges over the Pennsylvania tracks, as follows: Penn avenue bridge, to Gustav Kaufman for $12,810; Shady avenue bridge, to the Schultz Bridge and Iron Co. for $13,125; Highland avenue bridge, to the Schultz Bridge and Iron Co. for $17,795. Of the total cost of the three bridges the traction company is to pay $26,000 and the city the balance.

Plaquemine, La.—The King Bridge Co., of Cleveland, has the contract for the new iron drawbridge across Bayou Plaquemine. The contract price was $19,550.

Portland, Me.—The State Railroad Commissioners have approved the plans for a bridge over the Portland & Rochester track at Falmouth street; also the plans for a bridge to replace an old one crossing the Grand Trunk Railroad in Deering.

West Chester, Pa.—The contract for the stone abutments and wingwalls of the proposed bridge at Cook's Fording, on French Creek, has been let by the County Commissioners to Edward E. Super, of Lionville, Pa., for $394.50. The bridge, which was ordered by a jury over three years ago, will be 70 ft. span. The Commissioners have advertised for bids for the ironwork.

Wilmington, Del.—The Baltimore & Ohio Railroad has given a contract to Stewart & Keenan, of Baltimore, for the work in connection with abolishing grade crossings in Wilmington. The first work will be done at Pennsylvania avenue and Fourteenth street, where the railroad company will build bridges, and the streets will be sunk so as to pass under the tracks.

RAILROAD LAW—RECENT DECISIONS.

In New York an elevated railroad company which allows passengers to go upon its platform in such numbers as to crowd off the platform a passenger already there is liable for whatever injuries he sustains thereby, though its station is properly constructed and is large enough to answer all ordinary requirements (decided in App. Div. Sup. Ct., March, 1897).[1]

It is held in New York that the act of the legislature requiring every railroad company which operates a line more than 100 miles long within the state, and which is authorized by law to charge a maximum fare of not more than three cents a mile, to issue mileage books at a rate of not more than two cents a mile, is intended to include every railroad company operating a line of such length, except the New York Central. The passage of this act is held to be a valid exercise of the power of the State Legislature, as it should not be construed as extending the use of the mileage book beyond the boundaries of the state, and is therefore not in conflict with the laws regulating interstate commerce (decided in App. Div. Sup. Ct., March, 1897).[2]

At the time of the purchase of a mileage book, issued

pursuant to the statute last above referred to, the purchaser signed a contract whereby he agreed that it should be good for passage only when presented to the conductor with a passage ticket which had been exchanged for coupons detached from the book representing the distance to be traveled. He offered a mileage-book without the exchange ticket and the conductor refused to accept it. In an action to recover the penalty prescribed for the violation of the statute it is held that since the company was under a previous obligation to accept the mileage-book the contract was invalid for want of a consideration and that the plaintiff was entitled to recover (decided in Sup. Ct., April, 1897).[3]

The statute has been so amended as to require a passenger to obtain a ticket in exchange for coupons representing the distance to be traveled.[4]

A taxpayer cannot successfully attack a revocable license granted by the Dock Department of the City of New York permitting a street railroad company to construct and operate its road over land reclaimed from the river and under the immediate charge of the Department (App. Div. Sup. Ct., April, 1897).[5]

But the Dock Department cannot authorize a company to construct its railroad over the premises covered by the license when another corporation has already lawfully constructed or has lawful authority to construct its road there. Such another corporation, upon showing damage, may restrain the construction of the rival road as a public nuisance, and even when there is no accurate basis upon which to compute such damage may obtain an injunction for that purpose (decided in App. Div. Sup. Ct., April, 1897).[6]

In New York it is held that a railroad company is under no obligation, as a matter of law, to place or maintain gates at a crossing or to a station a flagman there unless directed to do so by an order of the Court, granted upon application of the local authorities (decided in Sup. Ct., May, 1897).[7]

The owner of property abutting on the line of a New York elevated railroad, who proves no depreciation in the value of his premises, is not entitled to recover damages for injury done them unless, by reason of the presence of the railroad he has failed to obtain the enhancement in value, naturally to be expected from the growth of the city, which has come to other property in the vicinity off the line of the road. He cannot recover for injury resulting from the fact that the presence of the road has changed the character of the street, but only for the injury caused by the structure and the operation of trains thereon so far as the same affect the light and air of and the access to his premises (decided in the App. Div. Sup. Ct., April, 1897).[8]

In Michigan it is held that if the driver of a fire department truck does not, in going to a fire, have his horses under such control that he can stop them on approaching a street traversed by street cars, where there was evidence that a car with which the truck collided was at a distance within which it could have been stopped, it is for the jury to decide whether he was guilty of such contributory negligence as to bar a recovery for injuries sustained by him in the collision, even though he has the right of way by city ordinance. An ordinance giving fire vehicles precedence over other vehicles does not give a right to them to enter upon a crowded thoroughfare without regard to consequences (decided in Sup. Ct., April, 1897).[9]

In Michigan it is held that the statute which provides that if a railroad company fails to fence it road and to maintain the fences it shall be liable for all damages sustained by any person in consequence of such failure, is not exclusively designed to prevent domestic animals from straying on the track, and where a young child gets upon the track in consequence of the absence of a fence and is injured, the company is liable to him for the injury (decided in the Sup. Ct., May, 1897).[10]

Until the date of this decision the rule of law in Michigan governing such cases as this was exactly contrary to the rule here established.[11]

In Michigan in consideration of the compromise of a disputed claim for personal injuries a railroad company agreed to employ the person injured as baggage master during his life or for so long as he was able to do the work. He afterward resigned his position under an agreement with the Division Superintendent that he could return to the railroad company's employment, if he chose, on the same conditions that obtained when he quit. He afterward applied for re employment and was re employed by the company, and continued in its service until he was finally discharged. In an action for breach of contract, arising from this discharge, it was held that the original agreement was valid, supported by a sufficient consideration, and binding on the company, and that the agreement for re-employment was not a new contract. The employee had merely had an indefinite leave of absence, which did not affect the employee's rights under the original contract, and which it was within the power of the Superintendent to grant (decided in the Sup. C., May 1897).[12]

In an action against a railroad to recover a penalty prescribed by a Michigan statute for failure to discharge a passenger at his destination it appeared that the plaintiff had bought a ticket for a station on the road and that when the train arrived at the station it was so crowded and there were so many persons waiting to take it that the defendant deemed it unsafe to stop and did not stop. On this state of facts it is held that the defendant was not excused from liability for the penalty (decided in the Sup. Ct., May, 1897).[13]

In Michigan, coal stored for the use of a railroad company in the operation of its road may be seized for fail ure of the company to pay a tax (decided in the Sup. Ct., May, 1897).[14]

In Michigan a person who, for his own convenience, crosses the track of a railroad company at a place other than a public crossing cannot recover for injuries received by falling over a semaphore wire, even though he has the permission of the company to so cross (decided in the Sup. Ct., May, 1897).[15]

A provision in a Minnesota statute requiring a railroad company to turn over to a storage company or public warehouseman all property which the consignee fails to call for within 20 days after notice of its arrival was declared unconstitutional and void, as being an arbitrary and unwarranted interference with the right of parties to contract with reference to the disposition of their own property (decided in the Sup. Ct., May, 1897).[16]

[1] McGearty v. Manhattan, 15 App. Div., 2.
[2] Beardsley v. N. Y., L. E. & W., et al., 15 App. Div., 251.
[3] Corcoran v. N. Y. C. & H. R., 20 Misc., 197.
[4] Chap. 835, Laws of 1896.
[5] Hart v. Mayor, etc., of N. Y., et al., 20 Misc., 227.
[6] Crosstown v. Metropolitan, 20 Misc., 229.
[7] Martin v. N. Y. C. & H. R., 20 Misc., 363.
[8] Stacey v. Met., et al., 15 App. Div., 534.
[9] Garrity v. Detroit Cit. Ry., 70 N. W., 1,018.
[10] Rosse v. St. P. & D., 71 N. W., 20.
[11] Fitzgerald v. Ry. Co., 29 Minn., 336.
[12] Stearns v. L. S. & M. S., 71 N. W., 148.
[13] Hoyt v. C. C. C. & St. L., 71 N. W., 172.
[14] Chicago & N. W. v. Ellson, 71 N. W., 321.
[15] Clark v. M. C., 71 N. W. 327.
[16] State v. C., M. & St. P., et al, 71 N. W., 400.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Buffalo, Rochester & Pittsburgh, 1 per cent., preferred, payable Aug. 16.

Canadian Pacific, 2 per cent. preferred and 1½ per cent. common, payable Oct. 1.

Chicago & Alton, quarterly, $1.75 per share, preferred and common, payable Sept. 1.

Cleveland & Pittsburgh, quarterly, 1¾ per cent., on guaranteed stock, payable Sept. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago, Milwaukee & St. Paul, for the election of directors, Milwaukee, Sept. 18.

New York, Susquehanna & Western, for the election of directors and other business, Jersey City, Sept. 2.

Wabash, annual, for the election of directors, St. Louis, Sept. 14.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *American Society of Railroad Superintendents* will hold its next meeting at Nashville, Tenn., beginning Sept. 22.

The *American Street Railway Association* will hold its sixteenth annual convention in Convention Hall, Niagara Falls, Oct. 19-22. 1897.

The *Association of Railway Superintendents of Bridges and Buildings* will hold its seventh annual convention at the Brown Palace Hotel, Denver, Col., beginning Oct. 19, 1897.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Master Car and Locomotive Painters' Association* will hold its annual convention at Old Point Comfort, Va., Sept. 8, 1897. Robert McKeon, Secretary, Kent, O.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *National Railroad Master Blacksmiths' Association* will hold its annual convention at Chicago Sept. 7.

The *New England Roadmasters' Association* will hold its annual convention at the Revere House, Boston, Mass., Aug. 18 and 19, 1897.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *Road Masters' Association of America* will hold its annual meeting at Old Point Comfort, Va., Sept. 14-16, 1897.

The *St. Louis Railway Club* holds its regular meeting on the second Friday of each month, at 3 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Traveling Engineers' Association* will hold its annual convention at Chicago Sept. 14.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

Western Society of Engineers.

A regular meeting of the Western Society of Engineers was held in the society rooms, Monadnock Block, Chicago, Wednesday evening, Aug. 4. Messrs. A. E. Broenniman and H. H. Ross presented a paper on "The Internal Hydrostatic Pressure in Masonry with Especial Reference to Masonry Dams."

The Association of American Steel Manufacturers.

The regular meeting of the Association was held at Atlantic City, July 23, and the following officers were elected: President, Mr. G. M. McCauley, General Manager, Central Iron & Steel Co.; Vice-President, A. F. Huston, First Vice-President, Lukens Iron & Steel Co.; Secretary and Treasurer, Mr. A. L. Colby, Metallurgical Engineer of the Bethlehem Iron Co.

American Boiler Manufacturers' Association.

The ninth annual convention of the American Boiler Manfacturers' Association of the United States and Canada was held in the Continental Hotel, Philadelphia, Pa., Aug. 3, 4 and 5. The meeting was called to order at 3:30 p. m., Tuesday, with Second Vice-President Henry J. Hartley in the chair. The Secretary reported a total membership of 51. Reports of committees on "Uniform State Inspection Law," James Lappam, Chairman, and "Materials and Tests," E. D. Meier, Chairman, were received. The evening session, which convened at 8:30 p. m., was given up principally to a discussion of the report of the committee on "Materials and Tests." At the third session, on Wednesday morning, papers on "The Acushnet Boiler Explosion," by B. S. Robinson, and "Little Nothings in Boiler Making," by Henry J. Hartley were read and discussed. The afternoon was spent in a visit to the plant of the Lukens Iron & Steel Co. at Coatesville. Special cars were provided by the company. On arriving at Coatesville at 2 o'clock the members and guests were met by A. T. Huston, President of the company, and escorted to his residence, where dinner was served. The last session, held on Thursday morning, concluded with discussions of topical questions. A vote of thanks was tendered Frederick R. Case, Secretary of the local Committee, for his attention to the comfort and entertainment of the members and their guests, which he certainly deserved. The Cramp shipyards and League Island Navy Yard were visited in the afternoon. On Friday morning the members and guests left for Atlantic City. The annual dinner was served at the Garden Hotel.

The officers elected for the ensuing year were: President, Henry J. Hartley, the William Cramp & Sons, Ship & Engine Building Co., Philadelphia; First Vice President, James Lappan, J. Lappan & Sons, Pittsburgh; Second Vice-President, D. Connelly, Cleveland Steam Boiler Works, Cleveland, O.; Third Vice-President, John O'Brien, St. Louis; Secretary, E. D. Meier, Heine Boiler Co., St. Louis, and Treasurer, Richard Hammond, Erie Engineering Co., Buffalo, N. Y. The next convention will be held in St. Louis during the first week in October, 1898. Among the firms represented at the convention were: Hoopes & Townsend, Philadelphia; William Sellers & Co., Incorp., Philadelphia; Bement, Miles & Co., Philadelphia; Ashton Valve Co., Boston; Lukens Iron & Steel Co., Coatesville, Pa.; Allison Mfg. Co., Philadelphia; Clonbrock Steam Boiler Co., Brooklyn, N. Y.; Jenkins Bros., New York City; Star Brass Mfg. Co., Boston; Globe Iron Works, Cleveland; Diamond State Iron Co., Wilmington, Del., and the Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn. The U. S. Navy was represented by L. M. Robinson and C. J. Halughurst, Chief Engineer.

PERSONAL.

—Mr. Thomas Watson, a well-known railroad builder and coal mine operator, died in Chicago Aug 3.

—Mr. S. King has been appointed Master Car Builder for the Middle and Northern divisions of the Grand Trunk.

—Mr. A. A. Holbrook, General Superintendent and Purchasing Agent of the Wilkes-Barre & Northern, has resigned.

—Mr. M. R. Spelman, General Agent of the Illinois Central at New Orleans, has resigned to engage in private business.

—Col. Curtis S. Watson, for 15 years a Director of the Junction & Breakwater, died at his home in Milford, Del., Aug. 4.

—Mr. E. S. Hitchins has been appointed Freight Auditor of the Chicago Great Western to succeed Mr. F. Hoppe, resigned.

—Mr. L. W. Frost has been appointed Southern New England Agent of the Lehigh Valley, with headquarters at New Haven, Conn.

—Mr. T. G. Slade has been appointed Acting Superintendent of the Eastern Railway of Minnesota, to succeed Mr. J. B. Rice, resigned.

—Mr. W. T. Backus, Superintendent of the Ohio Division of the Cincinnati, Jackson & Michigan (now the Cincinnati Northern), has resigned.

—Mr. Charles S. Turner, formerly President of the Worcester, Nashua & Rochester, died at his home in Worcester, Mass., Aug. 8, aged 68 years.

—Mr. S. H. Babcock, who some time ago resigned as General Traffic Manager of the Rio Grande Western, has been reappointed to the same position.

—Mr. T. J. Klase, formerly General Eastern Freight Agent of the Lehigh Valley at Boston, has been appointed Division Freight Agent of that road at Newark, N. J.

—Mr. C. H. Coombs, Commercial Agent for the Cotton Belt, at Fort Worth, Tex., has been promoted to the position of Commercial Agent of the same road at Atlanta, Ga.

—Mr. H. C. Landon, Chief Engineer of the Chicago, Peoria & St. Louis, has resigned to accept a similar position with the New York & Ottawa, with headquarters at Cornwall, Canada.

—Mr. S. W. Snow has resigned as Local Agent of the Fitchburg Railroad in Boston, and is succeeded by W. E. La More, who for two years past has been Chief Clerk at the Boston station.

—Mr. J. T Douglass has been appointed Traveling Passenger Agent of the Chicago Great Western, with headquarters at New York, to succeed Mr. J. M. Storr, transferred to St. Paul.

—Mr. Russell C. Root, of Tarrytown, N. Y., died in Stamford, Conn., Aug. 4, at 76 years of age. He was President for a number of years of the Harlem Extension (now the Lebanon Springs road).

—Mr. E. B. Lane, Traveling Freight and Live Stock Agent for the Missouri Pacific, has been appointed General Freight Agent of the Sedalia, Warsaw & Southwestern, with headquarters at Sedalia, Mo.

—Mr. R. H. Morris, Commercial Agent of the Louisville, Henderson & St. Louis, at St. Louis, has resigned and Mr. Walter Lindsay, Chief Clerk of the General Agent's office of the Louisville & Nashville, has been appointed his successor.

—Mr. Henry S. Marcy, President of the Fitchburg Railroad, died suddenly at his home in Belmont, Mass., last Tuesday afternoon. The cause of death was apoplexy. Mr. Marcy was born at Hartland, Vt., Jan. 28, 1837, and had spent all his life in railroad service in New England and New York. He began on the Sullivan Railroad in 1861, and was subsequently on the Rutland & Burlington, whence he went to the Rensselaer & Saratoga. When the latter was leased to the Delaware & Hudson Canal Co. he became General Freight Agent of the latter, holding the place about 18 years, his title dur-

ing the latter part of this period being General Traffic Manager. On Nov. 1, 1889, he was called to the presidency of the Fitchburg road, which place he held up to the time of his death. Mr. Marcy leaves a widow and four sons.

ELECTIONS AND APPOINTMENTS.

California Southern.—The officers and Directors of this road, whose incorporation was noted in these columns in our issue of May 7, are as follows: President, A. A. Dougherty; secretary, Charles Weir; directors, A. A. Dougherty, Charles Weir, John T. Jones, Martin C. Morris, C. Leonard, James Campbell, Dr. F. R. Frost, all of Los Angeles, and J. M. Burnett and C. E. Crowley, of Arizona.

Detroit, Toledo & Milwaukee.—The jurisdiction of the following officers of the Detroit & Lima Northern has been extended over this road: J. R. Megrue, Vice-President and General Manager, Detroit, Mich.; C. H. Roser, Chief Engineer and Purchasing Agent, headquarters Tecumseh, Mich.; G. R. Haskell, Superintendent, Tecumseh; A. L. Richmond, Auditor, Tecumseh; G. C. Shiffer, Car Accountant, Tecumseh; C. A. Chambers, General Freight and Passenger Agent.

Fonda, Johnstown & Gloversville.—At a recent meeting of the Directors, J. Ledlie Hees, Treasurer, was elected President of the company, and Geo. M. Place was elected Treasurer.

New Brunswick.—At the annual meeting of stockholders of this road (leased to the Canadian Pacific), held at St. John, N. B., Aug. 5, Directors were elected as follows: Sir Donald A. Smith, M. P., Robert Meighem, John Turnbull, Montreal; John S. Kennedy, Samuel Thorne, J. Kennedy Tod, D. Willis James, New York; E. R. Burpee, Bangor, Me; Hugh H. McLean, John McMillan, St. John. At a subsequent meeting the Directors elected the following officers: President, Robert Meighem; Vice-President, J. Kennedy Todd; Secretary-Treasurer, Alfred Seely, St. John; Land Agent, W. T. Whitehead; Solicitor, Hugh H. McLean.

Omaha, Kansas City & Eastern.—Officers of this road, whose consolidation was noted in these columns last week, have been appointed as follows: First Assistant General Freight and Passenger Agent, C. H. Spencer (formerly of the Quincy, Omaha & Kansas City); General Attorney, J. G. Trimble; Chief Engineer, E. M. Collins; Superintendent, A. E. Buchanan (formerly of the Omaha & St. Louis).

Sebasticook & Moosehead.—Stockholders of this company have elected the following Directors, who are also Directors of the Wiscassett & Quebec: Charles D. Haines, Stephen D Lake, Hiram McGonegal, of New York state, and Z. D. Lancaster, of Maine.

Wheeling & Lake Erie.—It has been decided to move the office of Superintendent J. F. Stout from Massillon, O., to Toledo. The office of O. P. Dunbar, Superintendent of Motive Power and Cars, will also be removed to Toledo from Norwalk, O. The Trainmaster and two Roadmasters will remain in Massillon. This change takes effect before Aug. 15.

Wilmington & Newbern.—The officers of this road, successor to the Wilmington, Newbern & Norfolk, the sale of which was noted in these columns on July 23, are as follows: President, W. G. Elliott; General Manager, J. R. Kenly; General Superintendent, John F. Divine; Traffic Manager, T. M. Emerson; General Auditor, W. A. Riach; Secretary and Treasurer, J. F. Post, Jr. The general officers are at Wilmington, N. C.

RAILROAD CONSTRUCTION,
Incorporations, Surveys, Etc.

Aroostook Northern.—Work has begun for building this road, which is projected to extend from Caribou, Me., on the Bangor & Aroostook, east 15½ miles to Limestone. R. H. Cushing is the engineer in charge.

Centralia & Chester.—An order has been entered by Judge Allen in the United States Circuit Court at Springfield, Ill., authorizing C. M. Forman, the Receiver of this road, in the suit of the Missouri Car & Foundry Co., to issue six per cent. receivers' certificates for not more than $200,000 to be sold for not less than 95 cents on the dollar. The proceeds will be used to extend the road south from Evansville, Ill., through Ellis Grove, Nile Mill, Kaskaskia, Fort Gage and Menard to Chester, about 18 miles. The grading has been completed for some time and the building of trestles and laying of rails are to be done by the company and not by contract. The track will be laid with 75-lb. rails, to be furnished by the Illinois Steel Co. This road went into the hands of a receiver in June. It extends from Evansville northeast to Centralia, Ill., 61.5 miles.

Chesapeake & Ohio.—On the Western Division of this road second track is being constructed from Buffalo to Stone Cliff, W. Va., about three miles, and from Huntington to Kenova, W. Va., seven miles. On this section 2,363 ft. of trestle has been filled in. The second track is also to be extended through Maysville, Ky., about three miles. This requires building a double track bridge of masonry for crossing a small creek. The work will probably be completed before winter. The company also will relay about 10 miles with 100-lb. rails, 45 miles with 75-lb. rails and nine miles with 70-lb. rails.

Columbus & Worthington.—This company was incorporated in Ohio, Aug. 9, with a capital of $100,000, to build a line from Columbus, northwest about 125 miles to a point on the western line of the state, in Paulding County. The incorporators are William V. Marquis, J. D. Emerson, W. M. Fisher, Robert Colpont and Ernest M. Hamilton.

Detroit, Toledo & Milwaukee.—This company (formerly the Cincinnati, Jackson & Mackinaw) is reported to be surveying the route for an extention of its line from Dundee, in Monroe County, Mich., at its junction with the Ann Arbor, northeast about 40 miles to Detroit.

East Richelieu Valley.—The contract for building this road (See "Canadian Roads" in this column July 16) has been let to J. L. Comte, of Montreal, Que. The route as projected is from Iberville south about 23 miles, up the east side of the Richelieu River to the Lacolle Bridge, to connect with the Canada Atlantic. It has been subsidized by the Quebec and Ottawa governments to the extent of $8,500 per mile. Philip H. Roy, 4 St. Lawrence street, Montreal, is President of the company. It is expected that the work will be completed this autumn.

Erie.—This company will double track and improve the alignment of its road between Sharon and Sharpsville, Pa., a distance of two miles.

Illinois Central.—Engineers of this company are now locating a branch line in Mitchell County, Ia., to extend from a point near Mona, on the Mona & Waterloo branch, to Staceyville, eight miles.

Lewis Run.—This company was incorporated in Pennsylvania Aug. 4 with a capital stock of $40,000, to build a line from a point on the Peter's Creek branch of the Pittsburgh, Virginia & Charleston in Jefferson Township, Pa., through Allegheny County to a point in Mifflin Township. The directors are: John Wilson, President; Daniel Jenkins, H. B. Scott and John Bierer, all of Pittsburgh, Pa.

Louisville & Augusta.—This company has been chartered in Georgia to build a line in Jefferson County, Ga., from Louisville, a point on the Louisville & Wadley Central, north to Wren Station on the Augusta Southern, 15 miles. The capital stock is fixed at $10,000 per mile. The names of the incorporators are: James U. Jackson, Fred T. Lockhart, J. J. Doughty, F. W. Scofield and C. W. Jackson, all of Augusta, Ga.; W. L. Phillips, W. J. Lowry and W. A. Willie, of Louisville, Ga.; A. H. Wooten, Wadley, Ga., and W. J. Wren, Wren Station. The company is chartered for 100 years, and its principal office is Louisville.

Milwaukee, Benton Harbor & Columbus.—Train service began on this line Aug. 9 between Benton Harbor and Buchanan, Mich. The road as projected is to run from Benton Harbor, through Buchanan, southeast to Napanee, Ind.

New York & Ottawa.—This company has been chartered, with capital stock of $480,000, in New York state to build a line in Franklin County, N. Y., from Moira north about 18 miles to a point on the St. Lawrence River. The directors are George Foster Peabody, Spencer Trask, R. B. Moffat, George B. Moffat and Alexander White, Jr., New York; George H. Maddock, Boston; Charles B. Hibbard, Moira; Charles J. Peabody, Englewood, N. J., and Henry Sanger Snow, Brooklyn.

Ohio River, Frankfort & Western.—This company has been incorporated in Kentucky, with a capital of $100,000 to build a line from Dover, Ky., a point on the Chesapeake & Ohio, south about 200 miles to Knoxville, Tenn.

Santa Fe & Grand Canon.—This company has been incorporated in Arizona with a capital of $1,000,000 to build a line from a point on the Santa Fe Pacific near Williams, Ariz., north about 70 miles to the Grand Canon of Colorado. The incorporators are: Thomas R. Lombard, Charles E. Potter, J. C. McFarland, Edwin Chase, Edwin N. Hyde, Lower W. Goode, Groynne Dennis, W. M. O'Neil. Mr. O'Neil, who is Mayor of Prescott, Ariz., and has been elected General Manager, is now in the East completing necessary financial arrangements.

Seaboard, (Ala).—It is reported that this company is building an extension of five miles from Nannahubba, in Washington County, Ala., northwest toward Healing Springs. The road now extends from Nannahubba southeast 24 miles to Tuscarora with a branch of seven miles from David's Lake to River Junction. S. T. Price, Mobile, Ala., is the Receiver.

Smith's Ferry.—A charter was granted in Pennsylvania Aug. 4 to this company, capitalized at $2,000, to build a line three fourths of a mile long in Beaver County, and Joseph B. Dawson, of Beaver Falls, is President.

South Alabama & Gulf.—This company is about to build a line from Greenville, on the Louisville & Nashville, east 21 miles to Rutledge, Ala., a point on the Alabama Midland (Plant system). A charter for this company was granted in 1894, the capital stock being fixed at $50,000, with the privilege of increasing to $2,000,000. The present officers are: President, W. H. Parrish, Richmond, Va.; Vice-President and General Manager, W. B. Gilmer, Greenville; Treasurer, J. F. Thomas, Greenville, and Secretary, R. Y. Porter.

Tennessee Central.—At a meeting of the Directors held in Nashville on Aug. 3 it was decided to make application for an extension of the charter to enable the company to extend the proposed road from Nashville, northwest to Clarksville, Tenn. about 50 miles. Plans are already in progress for building a line from Monterey, the terminus of the Nashville & Knoxville, to Knoxville, about 92 miles, the grading having been completed to Harriman, about 60 miles. There is a break of about 80 miles between Nashville and Monterey in the two proposed lines. But these points are connected by the Nashville & Knoxville and the Nashville, Chattanooga & St. Louis, and the plans of the Tennessee Central include some attempted arrangement with the roads.

Ventura & Ojai Valley.—The contract for building this road has been let to Grant Bros., San Francisco, who are required to complete it on or before March 1, 1898. The road as projected is to extend from Ventura, Cal., north about 25 miles up the Ojai Valley to Nordhoff, and thence about five miles to Hobart.

Electric Railroad Construction.

Baltimore, Md.—It is reported that the Consolidated Railway Co. will build an extension of its Linden avenue line, from Linden avenue along Whiteloo street, to connect with the Druid Hill avenue line.

Bangor, Me.—Construction work on the Bangor, Hampton & Winterport Electric Railway has been begun by the New England Construction Co. The road as proposed will be 54 miles in length, passing through Winterport, Prospect, Monroe and other villages.

Beaver Falls, Pa.—Simon Harrold, who holds the contract for building the Riverview electric road in Beaver Falls, has sublet the work to Funkhouser & Coates, for $30,000. It is proposed to begin grading at once. The road will run from the Pittsburgh & Lake Erie station, two miles across the town, to connect with the Beaver Valley Traction Company's line. E. L. Hutchinson is president of the company.

The contract has been let for the construction of a new electric road to be two miles in length and to be completed inside of two months.

Biddeford, Me.—Surveys have been made for an electric road from Biddeford to Bonny Eagle, a distance of about 18 miles. If the road is continuous between the cities named, it will be necessary to bridge the Saco River.

Butler, Pa.—The Butler Electric Traction Co. has petitioned for right of way on Zeigler avenue, Centre avenue, McKean, E. Wayne, Main, Jefferson, Second, Brady, Monroe, Locust, Franklin, Fulton, Race and Willow streets and Fair avenue. A committee was appointed to investigate the matter and report at next meeting.

Charleston, S. C.—It is announced that the promoters of the Summerville Street Railway Co. will apply for a charter to build a line connecting Summerville with Charleston.

Cleveland, O.—The Cleveland & Akron road, which it is proposed to operate over private right of way between the cities mentioned in the title, has planned to carry freight as well as passengers.

Collegeville, Pa.—Town Council has granted a right of way through Collegeville to the Collegeville Electric Railway Co.

East Liverpool, O.—Messrs. M. and J. Head, of the East Liverpool, Frederickstown & Lisbon Electric Railway Co. have purchased options on property leading into East Liverpool, and are making an arrangement for a terminal at East Liverpool. It is proposed to build a passenger and freight line to be operated by electricity from East Liverpool, connecting with the Erie and Baltimore & Ohio at Lisbon and Niles. The right of way has been secured, and it is announced that grading will begin within six weeks. The company is capitalized at $500,000.

Fayette City, Pa.—The Charleroi, Bellevernon & Fayette City Street Railway Co. is building a line from Lock No 4 on the Monongahela River through the borough of Charleroi to Bellevernon Station in Washington County, on the P. R. R. The total distance is 2½ miles. It is proposed to build a single track road of 80-lb. 7-in. girder rails. The capital stock at present is $20,000, divided into 400 shares of $50 each, which will probably be increased after the road has been completed. The President is William M. Bell and the Secretary and Treasurer is John A. Irwin, both of Pittsburgh, Pa.

Hartford, Conn.—The Park Street Railway Co. has asked permission to double-track its Park street and Jefferson street lines. A public hearing on the above applications will be held this week. The company has also petitioned to widen its tracks on a number of streets, and also to build a turnout on the New Britain Avenue line.

Lexington, Mass.—The Lexington Street Railway Co. has been organized for the purpose of building a street railroad from Waltham, through Lexington and Arlington, to Woburn, making a line 15 miles in length. The capital stock of the company will be $150,000. The temporary directors of the company are: L. A. Saville and Alfred Pierce, Lexington; O. M. Gove, Waltham; Walter H. Pierce, Arlington; Charles Cummings, Woburn; Charles E. Dresser, Leominster; Robert B. Taber, Cambridge.

Meadville, Pa.—The Meadville Street Railway Co. has filed its charter for the construction of a street railroad in Meadville, and extension of the line to Edinboro through Cambridge Springs. The capital stock of the company is $350,000, divided into 7,000 shares of $50 each.

Montoursville, Pa.—James N. Blackwell, of Montoursville, has been awarded the contract for the stone for the foundation of the power-house of the Montoursville electric line, and G. Waltz, also of the same place, secured the contract for the entire construction and erection of the building. The company has decided to do the excavation itself.

Omaha, Neb.—The Omaha & Council Bluffs Street Railway & Bridge Co. has been granted an extension of its franchise for a period of 50 years from Aug. 2.

Redlands, Cal.—Mr. H. H. Sinclair, of the Southern California Power Co., states that a contract has been made between the Los Angeles Street Railway Co. and the Southern California Power Co., whereby the latter agrees to furnish power for the operation of the electric cars in Los Angeles for 20 years, the railroad company paying $50,000 a year as the minimum and $150,000 as the maximum for the power. The power plant is in the Santa Ana Canon, about 80 miles from Redlands, so that this will be the longest transmission in this country.

Savona, N. Y.—The construction work on the Savona, Bradford & Penn Yan Railway has been begun. The road as proposed is 31 miles long from Savona to Penn Yan, connecting with the Rochester Branch of the Erie at Savona, and the Fall Brook Railroad at Penn Yan. The President is George F. Andrews, Oswego, N. Y. Information in regard to the new power-house for the road will be found among our notes of June 4 last.

Scranton, Pa.—Mayor Bailey has signed the ordinance granting the Scranton Street Railway Co. the right to make extensions in West Scranton. Some of the work will be completed before winter.

Sherbrooke, Que.—Contracts for motors and generators for the proposed street railroad have been given to the Canadian General Electric Co., for closed cars to Messrs. Rhodes, Curry & Co., of Amherst, N. S., and for open cars to Messrs. Ahearn & Soper, Ottawa, Ont. Messrs. Loomis & Sons are now building the power-house for the electric road.

Toronto, Ont.—The Toronto Street Railroad Co. has petitioned the municipality to grant permission to build an electric line over the Avenue road to the Mt. Pleasant Cemetery. A special meeting of the Council will be held to consider the proposal.

Construction work has been begun on the Queen street extension to Monroe Park.

West Newton, Pa.—Versailles Borough Council has passed an ordinance granting the West Newton & Youghiogheny Street Railway Co right of way through the borough. The company proposes to sell six tickets for 25 cents and expend about $15,000 on street improvements. The road may also extend from West Newton to McKeesport, about 19 miles. Work will be commenced at once.

Wilmington, Del.—The contract for building the Wilmington & Brandywine Springs electric road has been given to Vandegrift & Jacobs, of Philadelphia, who expect to begin grading soon. The franchise to enter Wilmington via Sixth street, in accordance with the charter provision of the company, will come up before the Street and Sewer Department of the city at its next meeting. The road will run from Wilmington west to Brandywine Springs, about five miles.

Windham, N. Y.—The Windham Traction Co. has been incorporated to build an electric road 20 miles in length, from Durham to East Windham, passing through Conesville, Windham and Hensonville. The capital stock is $250,000. The Directors include W. G. Raines T. E. Smith, of New York, and George C. Spencer, of Chicago.

GENERAL RAILROAD NEWS.

Cincinnati, Jackson & Mackinaw.—The Michigan Division, which was reorganized last June as the Detroit, Toledo & Milwaukee, has been sold to the Detroit & Lima Northern, which took possession of the property Aug. 1. The latter company was formed in June, 1897, by a consolidation of the Lima Northern and the Detroit & Lima Northern, thus forming a line 98 miles long from Lima, O., north to Tecumseh, Mich. The Detroit, Toledo & Milwaukee extends from Allegan, Mich., southeast to Toledo, O., 156 miles, of which 133 miles between Allegan and Dundee, Mich., is owned by the company; it connects with the Detroit & Lima Northern at Tecumseh, which will hereafter be the headquarters of the mechanical department of the latter company. The terms of the sale have not yet been made public. The Ohio Division of the Cincinnati, Jackson & Mackinaw, which extends from Cincinnati to Jackson, Mich., 247 miles, has been reorganized under the name of the Cincinnati Northern. President Calvin S. Brice has announced that all officers of this division will remain in the service of the road until further notice.

Cleveland, Canton & Southern.—The Knickerbocker Trust Co., of New York, as trustee for $10,000,000 of bonds of this road, filed a cross bill in the United States Court at Columbus, O., Aug. 7, in a suit brought by the International Trust Co., of Boston, to foreclose the mortgage on the road. The Knickerbocker Trust Co. holds that the $2,000,000 bonds of this road held in trust by the International Trust Co. are invalid on the ground that when they were issued in 1887 the authorized stock was but $200,000, thus breaking the Ohio law which forbids the issue of more bonds than stock. The road has been in the hands of receivers since Sept. 15, 1893.

Galveston, Houston & Henderson.—This company, as noted in these columns July 30, made application to the City Council of Galveston, Tex., for permission to extend its road in Mechanic street from Thirty-seventh to Twenty-fifth streets. The Gulf, Colorado & Santa Fe at once applied for an injunction against granting the franchise on the ground that it had been given the same privilege by an earlier ordinance, and proceeded to lay track over the street in question. Now Judge W. H. Stewart, of the District Court at Galveston, refuses to grant the injunction and leaves the parties to their rights under the law.

Lebanon Springs.—Justice Chase, of the New York Supreme Court, has confirmed the order of Elnathan Sweet, Receiver, for the total suspension of traffic on this road, as noted in this column last week. The first order of the Justice was that the road be operated until further orders from the Court, but later the road was ordered closed without delay. All employees are discharged and all stations and repair shops closed.

Norfolk & Western.—The earnings for June and for the nine months ended June 30 were as follows:

	1897.	1896.	Inc or Dec.
June:			
Gross earn	$842,301	$945 114	D. $102 813
Oper. expen	640.358	755,656	D. 115 298
Net earn	$201,943	$189,458	I. $12,485
Nin Months:			
Gross earn	$7,910,075	$8,469.193	D. $553,118
Oper. expen	5.768.794	6.715,294	946,500
Net earn	$2,141,281	$1,753,899	$387,382

Richmond, Nicholasville, Irvine & Beattyville.—By order of the Federal Court the upset price of this road has been reduced from $250,000 to $160,000, and the sale will take place at some time after Sept. 1. The road was offered for sale at the higher upset price on Jan. 23 with no bidders. The company was chartered in 1888 to build a line from Versailles to Beattyville, Ky., 97 miles, and from Beattyville to Jellico or Middleborough, Ky., 100 miles. Only the 61 miles from Versailles to Irvine have been completed. The first sale of the road was ordered for May 9, 1896, the upset price being $550,000. The total amount of stock and bonds outstanding is $4,800,000. There are said to be about $138,000 of Receivers' certificates outstanding which take priority over the bonds. The road went into the hands of a Receiver Dec. 2, 1891.

Southwestern (Fla.).—Judge Rhydon M. Call, of the Circuit Court at Jacksonville, Fla., made a decree Aug. 2, making permanent the injunction of Feb. 19, 1896, which restrains the company from removing its tracks and compels it to continue operating the road. This is a narrow-gage line, extending from Green Cove Springs to Melrose, Fla., 33.5 miles. It was built as a logging road and after the timber had been removed the owners desired to take up the track, although there was some passenger and merchandise traffic. Trains have not been run for some time. The company was first organized as the Green Cove Springs & Melrose, but was reorganized in 1892 under the present name.

Union Pacific.—The Reorganization Committee of this road calls upon the holders of certificates for shares deposited under the plan of reorganization to pay the first installment of 5 per cent. of the par value of these certificates at the office of its agents in New York City on or before Aug. 26. The recent decree of sale of the road is made the occasion for this call. The Receivers have filed in the United States Court at Omaha, Neb., an approximate statement of the finances of the road as they will appear on Oct. 1, the receipts for June, July, August and September being estimated as equal to those of the corresponding period of last year.

Electric Railroad News.

Baltimore, Md.—A mortgage deed has been placed on record from the Falls Road Electric Railway Co. to the Maryland Trust Co. to secure the issue of $552,000 50-year five per cent. gold bonds, dated May 1, 1897, and principal falling due May 1, 1947. The bonds are secured by all the property and franchises of the road, including nine miles of completed tracks and rolling stock, both of the main line to Pikesville and Arlington branch.

Birmingham, Ala.—The property of the East Birmingham Land & Railway Co. has been conveyed to the Birmingham & Gate City Railway Co., the consideration being $30,000 worth of stock in the latter company. A deed was filed to give a clear title to the property.

Doylestown, Pa.—The Chestnut Hill & Jenkinstown Railroad Co., the Langhorn & Bristol Railroad Co., and the Schuylkill River West Side Railroad Co., have been dissolved by the mutual consent of the stockholders of the three companies.

Du Bois, Pa.—The Du Bois *Express* states that the plants, rights, privileges, real estate, rights of way, franchises and all the corporate properties of the Du Bois Traction Passenger Railway Co., and of the Du Bois Electric Light, Power & Heat Co. have been sold.

Greenfield, Mass.—Arrangements have been completed for the transfer of a large proportion of the stock of the Greenfield & Turners Fall Street Railway Co. to Greenfield stockholders. This will probably result in the removal of the Treasurer's office to Greenfield.

Lewiston, Me.—Hon. F. H. Twitchell confirms the report that a controlling interest in the bonds of the Lewiston & Auburn Horse Railroad Co. has been purchased by a syndicate including Hon. G. C. Moses, of Bath; Amos Gerald, of Fairfield, and Hon. I. C. Libby, of Waterville. The road is 14 miles in length and is operated by electricity. The authorized capital stock is $100,000, nearly all of which has been issued.

Milwaukee, Wis.—The Milwaukee Electric Railway and Light Co. has completed negotiations for the purchase of the property of the Waukesha Beach Electric Railway Co. The latter line is said to have cost $106,000 and includes about seven miles of track and a well-built power station. The line will probably be completed between Milwaukee and Waukesha by July, 1898.

Syracuse, N. Y.—The Common Council has revoked the new speed ordinance under which the Rapid Transit Railway Co. has been operating its cars for several weeks. This means that the speed of eight miles an hour through the city must not be exceeded by any of the companies.

TRAFFIC.

Traffic Notes.

The Baltimore & Ohio reports that since the establishment of its rail and lake line by way of Fairport, O., the increase of freight traffic passing through Fairport has been about 25 per cent.

The proposition to establish a new Southwestern Passenger Association seems to be slowly making progress. There was a meeting of the passenger representatives of the principal roads southwest of St. Louis last week, at which the main features of a new agreement were settled. Mr. W. W. Kent will no doubt be at the head of the association, as of the old one.

The arbitrators of the Joint Traffic Association have rendered a decision allowing the Pittsburgh, Cincinnati, Chicago & St. Louis to make a reduction of $2 in the first-class passenger fare between Chicago and New York. This makes the Pan Handle a differential line, along with the Erie, the Grand Trunk, the New York, Chicago & St. Louis and the Baltimore & Ohio.

On Monday last the Mallory and the Morgan lines reduced freight rates by steamer from New York to Galveston to 2 cents per 100 lbs. and at last accounts were carrying full shiploads. The new Lone Star line refused to go below the existing basis, 10 cents per 100 lbs. (first-class) which is far below the normal rate, claiming to get full boats without carrying the reduction any farther.

The Chicago, Burlington & Quincy has been supplying coal for the operation of threshing machines at stations along the line of its road. It appears that on account of the strike there were shortages at some places and interference with grain shipments was threatened; but the road took prompt measures to learn the needs of the farmers at each station, and sent out over 100 carloads of coal.

It appears that the ticket brokers of Cleveland have lately been doing a little business in the way of gathering individual passengers into parties of 10, and securing reduced rates by purchasing party tickets; but, according to a local paper, the railroads, some of which at first looked leniently on this performance, have now put a stop to it; and furthermore are trying as hard as they can to starve out the scalpers entirely.

The grain movement from the West to Chicago continues very heavy, and all of the roads now report good business. Westbound freight is also moving in more encouraging volume than for some time past. Talk is even heard about competition among shippers for cars, so that rates in that territory are likely to be maintained, in spite of the confirmed cutting habits of the traffic men. Receipts of live stock are also heavy.

Manager E. E. England, of the Mobile Freight Bureau, has just made his second annual report, in which he recounts a large number of instances wherein the Bureau has secured readjustment of railroad rates, to the advantage of the shippers and receivers of Mobile. He says that during the past two years over 1,200 complaints have been presented to the railroads. The relations of the Bureau with the railroads of the city are of a most cordial nature.

The Railroad Commissioners of Georgia, by a vote of two to three, have refused to make a reduction of 25 per cent. in freight rates on cotton, as asked for by the Savannah Cotton Exchange and others. Commissioner Fort, who voted against this resolution, writes a dissenting opinion, holding that the large quantity of cotton to be shipped this year, the low price and the recent reductions in the cost of transportation warrant a reduction of the rate, at least to the extent of 10 per cent.

A committee of San Francisco citizens is trying to have the next meetings of the National Educational Association and of the Grand Army of the Republic held in that city; and, as appears from a press dispatch, the General Passenger Agent of the Southern Pacific has sent to his connections a circular asking them to facilitate the project by granting low rates. Such action on the part of the Southern Pacific must be depressing upon those gossips who have professed to believe that the recent low excursion rates to California were unsatisfactory to the railroads.

The applications of the railroads doing business in South Dakota for an injunction restraining the State Railroad Commissioners from promulgating their new freight and passenger rates, appears to have been successful, the United States District Court at Sioux Falls, holding that all action taken by the Commissioners prior to July 1 was invalid because the law did not go into effect until that day. It appears that there is a constitutional provision that laws shall not go into effect until 90 days after their passage, and a legislative provision, made several years ago, that a law of this kind shall not go into effect until July 1; the Commissioners appear to have regarded the first-named condition only.

The receipts of grain at New York by the Erie Canal for the three months ending July 31 were 8,008,700 bu., as compared with 14,563,550 bu. in the same period of 1896, while receipts by rail this year were 33,557,384 bu. as compared with 22,248,695 bu. in 1896. The great excess of rail receipts over those by canal, 25 000,000 bu., as compared with an excess of only 8,000,000 last year, is attributable to very low rates made by the railroads. Canal rates have been very low, but the railroads went still lower. Wheat is about 2½ cents a bushel, Buffalo to New York, and has been as low as 2⅛ cents. Some boatmen have virtually gone out of business on account of the low rates and are letting their boats at nominal prices to the railroads for use as lighters in New York harbor.

A press dispatch from Kingston, N. Y., reports that the recent reduction in the rates for the transportation of milk to New York from points within 100 miles, thus putting at a disadvantage the shippers farther away, who had before enjoyed the same rates as those nearer by, is greatly injuring the business of the more distant shippers. The large creameries in Ulster and Delaware counties contemplate removing their bottling apparatus to New York so as to make a saving in freight, the rate on milk in bottles being higher than on that in cans, whereas before it was the same per quart for both. Dairymen in Orange County, which lies within the first and second groups of stations from New York, have been buying cows in Delaware County and the more distant regions.

At Springfield, Md., in 1891 a consignee named Herr received two cars of lumber from Washington which were allowed to stand at the station so long that they were sold for demurrage, and the Supreme Court of the District of Columbia has just decided that the railroad company was acting within its legal rights in thus selling the goods for charges. The bill of lading clearly included demurrage and storage in the statement of charges for which the carrier should have a lien upon the goods. The consignee tried to make out that the contract made by the shipper was not binding upon him, but the Court says that the ownership of the goods was absolutely in the shipper until they were delivered to the railroad, and that, therefore, he had full power to make any reasonable contract, and the consignee, becoming the owner of the goods, is bound by the contract made when the bill of lading was issued.

Chicago Traffic Matters.

CHICAGO, Aug. 11, 1897.

Eastern roads are again evening up their percentages on freight. The B. & O. and the Erie, which heretofore have far exceeded their allottment, are directing shipments to the Michigan Central and the Wabash. It is said that some small shippers are protesting.

There is trouble over the excursion fares to the Grand Army Reunion at Buffalo. It was started by the Chicago & Northwestern manipulating tourist sleeping-car rates in order to cut the regularly authorized passenger rates. The St. Paul road promptly took up the fight, and it now appears that low tourist car rates will be made from all territory between Chicago and the Mississippi River. In addition the Soo line has made a $16 round-trip rate from Minneapolis to Buffalo, forcing all the Western lines to make the same rate via Chicago.

The war in sleeping-car rates will be watched with a good deal of interest, as the Chicago, Milwaukee & St. Paul has no sleeping cars except its own, and few, if any, tourist or second-class cars, while the Northwestern has the Wagner Company with its large reserve supply of cars. The Northwestern is advertising for the accommodation of the G. A. R. business in all the territory from Chicago to the Missouri River, both $25 per diem rates and berth rates, both much below standard first-class sleeping-car rates. The tourist-car berth-rate quoted by the Wagner Company, Chicago to Buffalo, is $1.50; the Northwestern makes the same rate from Milwaukee, Madison and points in Northern Illinois, and $2 to $3 from points in Minnesota, Iowa and Dakota. It is said that the cars to be used for the business are the older style of Wagner sleeping cars with low back seats, but in other respects about as good as first-class cars. For this class of business these cars at the rates named are likely to carry a large share of both competitive and non-competitive traffic, and first-class sleeping cars at first class rates will not get much of the business. While the Chicago, Milwaukee & St. Paul has a number of old-style sleeping cars which might be used as tourist cars, and indeed have been so used on a number of occasions, they have not a sufficient number to meet competition in a large territory. However, if the Northwestern stands out, the St. Paul threatens to use all its extra sleeping-car equipment, first-class and otherwise, at tourist-car rates and to take such other means to equalize rates as may be necessary.

The Western roads after much discussion have partially settled Wisconsin Valley lumber rates. Rates from that territory to Iowa points have been fixed up by a compromise, and new rates will become effective Aug. 20. Rates from interior Wisconsin points, as against Winona and La Crosse, to Illinois points are still in dispute.

The eastbound rate situation out of Chicago is still far from being in good shape, and it is said that new provision and grain cuts have been made. Westbound merchandise rates are cut 25 per cent. for the larger houses, and lake and rail rates eastbound are unsteady. Rates on provisions from St. Louis to New York are cut 40 per cent., and all the Missouri River provisions that usually move via the Chicago junctions are now going via East St. Louis.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the Western termini of the trunk lines for the week ending Aug. 5 amounted to 69,255 tons, as compared with 57,324 tons the preceding week. This statement includes 24,600 tons of grain, 2,756 tons of flour and 16,981 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	Week Ending Aug. 5.		Week Ending July 29.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio	2,668	3.9	3,010	5 3
C., C., C. & St. Louis	1,760	2 5	1,641	2.9
Erie	11,612	16.8	10,555	18.4
Grand Trunk	6,548	9.5	5,728	10.0
L. S. & M. S	5,277	7.6	5,096	8.9
Michigan Central	9,897	14.3	6,596	11.5
N. Y., Chi. & St. L	9,397	13.6	8,050	14.0
Pitts., Cin., Chi. & St. Louis	5,156	7.4	4,424	7.7
Pitts., Ft. Wayne & Chicago	7.773	11.2	6,312	11.0
Wabash	9,167	13.2	5,912	10.3
Totals	69,255	100.0	57,324	100.0

Lake shipments last week were 110,994 tons.